Department of Agriculture
New South Wales.

N.S.W. DEPARTMENT OF AGRICULTURE

BIOLOGY BRANCH—DIVISION OF SCIENCE SERVICES

PLANT DISEASE SURVEY

FOR THE

TWELVE MONTHS ENDING 30th JUNE, 1960

Thirtieth Annual Report

Notes compiled by officers of the Plant Pathological Section of the Biology Branch, New South Wales Department of Agriculture, Rydalmere, Australia

COMMONWEALTH
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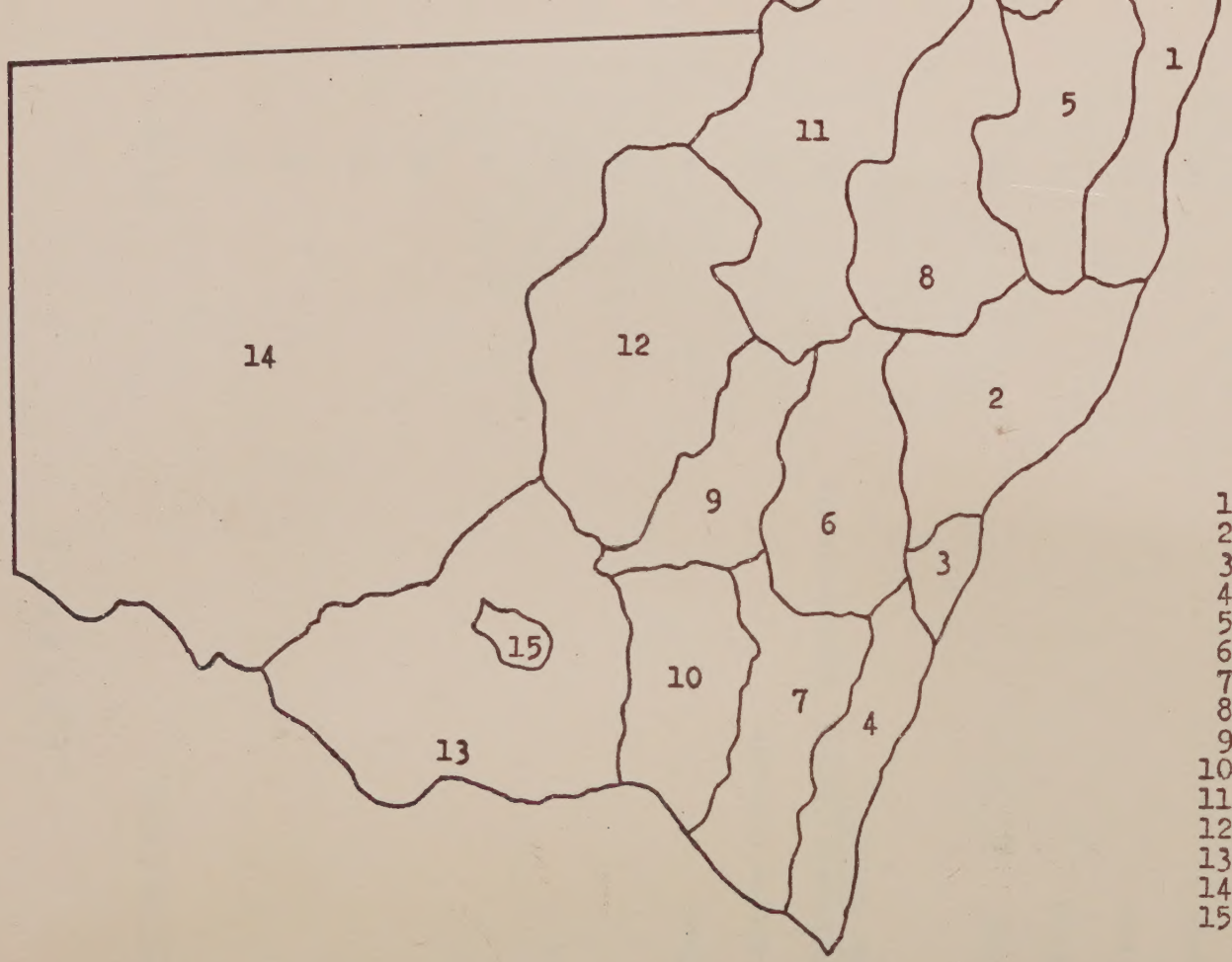

1. North Coast (N.C.)
2. Central Coast (C.C.)
3. Metropolitan Area (M.A.)
4. South Coast (S.C.)
5. Northern Tableland (N.T.)
6. Central Tableland (C.T.)
7. Southern Tableland (S.T.)
8. North Western Slope (N.W.S.)
9. Central Western Slope (C.W.S.)
10. South Western Slope (S.W.S.)
11. North Western Plain (N.W.P.)
12. Central Western Plain (C.W.P.)
13. Riverina (R.)
14. Western Division (W.D.)
15. Murrumbidgee Irrigation Areas (M.I.A.)

DISTRICTS OF NEW SOUTH WALES.

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CEREALS

WHEAT

Sowing conditions for the 1959-60 season were good in most districts but were followed by a dry winter and early spring. However, rain in October and November improved prospects and ensured better than average yields. It has been estimated that approximately 73,000,000 bushels were harvested from 3,800,000 acres sown for grain - an average yield of approximately 19.2 bushels per acre. As a result of the dry conditions diseases were considerably less important than in the previous season.

FROST INJURY occurred as usual but was severe only in isolated crops. Although the winter was again unusually mild it is thought that the dry conditions prevented soft growth and that there were fewer severe frosts at critical stages.

STEM RUST (Puccinia graminis tritici) caused little damage except in occasional late sown crops. The season was of interest, however, in that the presence of a strain, 21-4, capable of attacking Spica and Glenwari, was detected in the annual rust survey conducted by members of the Faculty of Agriculture of the University of Sydney. Another new strain, 34-3, was collected from one locality in Queensland. Whether or not these strains will be important remains to be seen. Festival remains resistant to the strains present and so does Eureka, except at high temperatures, as, in spite of the damage to this variety in the nineteen forties, the races virulent on it have not built up again.

LEAF RUST (Puccinia triticina) occurred as usual but no records of serious damage came in. An interesting feature of the season was a report from the University of Sydney of the detection of a strain 68-4 for the first time, which is able to attack Kenya 1483, a hitherto valuable source of resistance in Australia.

BUNT (Tilletia caries and T. foetida) was again not observed in the field but was recorded after harvest in more samples than usual from the central portion of the wheat belt. In all cases investigated the seed used had not been treated.

FLAG SMUT (Urocystis tritici) was again quite common in crops of Gabo in the north west but of little importance. On the other hand a 150 acre crop at Dubbo (C.W.S.) was almost ruined, the disease being worst on light poor soil and almost absent on heavy black soil.

TAKE-ALL (Ophiobolus graminis) was quite common in central and southern districts, particularly in crops following improved pasture. Serious yield reductions were recorded in some instances.

FOOT ROT (Helminthosporium sativum, Fusarium spp. and other fungi) occurred as usual throughout the State and serious damage occurred in isolated crops. Fusarium graminearum, which is the major foot-rotting pathogen in Queensland, was recorded from many localities in northern N.S.W.

POWDERY MILDEW (Erysiphe graminis) was again observed on crops in the north-west, but was usually confined to the basal leaves or leaf sheaths. The disease was unusually severe on a crop at Narrabri (N.W.P.) in August.

SEEDLING BLIGHT (Rhizoctonia solani) was recorded in a crop at Berrigan (R.).

POOR GERMINATION was widespread in the winter of 1960 and is thought to be the result of sowing with inadequate moisture.

LEAF YELLOWING was very common late in the winter of 1959 and also appears to have been associated with the dry conditions.

HEAT BANDING and COLLAPSE was observed in a seedling stand of Winter Minflor at Quirindi (N.W.S.) in April, 50% of the plants being affected in some parts of the crop.

YELLOW DWARF (virus) was recorded from Illabo (S.W.S.) and probably occurred elsewhere.

HAIL LOSS. Usually hail storms occur with some degree of regularity throughout the wheat growing areas of N.S.W. This season, however, there was very little damage in the Riverina, while northern and central districts had losses of considerable severity. The estimated hail loss is 1,450,000 bushels, approximately 2% of the total harvest.

OATS

It is estimated that approximately 1,100,000 acres were sown in N.S.W. in the 1959-60 season, that 12,000,000 bushels of grain were harvested from 680,000 acres, and that 120,000 tons of hay were cut from 103,000 acres.

STEM RUST (Puccinia graminis avenae) was not observed causing any appreciable damage.

LEAF RUST (Puccinia coronata) was prevalent, as usual, in coastal crops.

LEAF SPOT (Helminthosporium avenae) was unusually severe on a crop at Cootamundra (S.W.S.) after a period of cold wet weather in August.

SEEDLING BLIGHT (undet.) caused a considerable reduction in a stand of Dale at Upper Horton (N.W.S.).

STUNTING AND REDDENING was observed in crops at Taree (C.C.), Orange (C.T.) and many other areas. The condition occurred during a cold, dry period, but in some crops may have been caused by YELLOW DWARF (virus) which was definitely identified in a crop of Dale at Illabo (S.W.S.).

BARLEY

COVERED SMUT (Ustilago hordei) was common as usual but apparently unimportant.

POWDERY MILDEW (Erysiphe graminis), which is usually most uncommon in inland districts, was severe on a crop of 2-Row Chevalier at Cowra (C.W.S.) during the winter.

TAKE-ALL (Ophiobolus graminis) was recorded in a crop at Young (S.W.S.).

RYE

STEM RUST (Puccinia graminis) occurred as usual but there were no records of damage. The rust recorded on rye in N.S.W. is usually P. graminis tritici but the members of the Faculty of Agriculture, University of Sydney, report that P. graminis secalis is increasing in prevalence throughout the wheat belt.

MAIZE

LEAF BLIGHT (Helminthosporium turcicum) was severe in coastal districts. G.H. 128 again showed up well as a result of degree of resistance it shows. The disease was particularly severe in sweet corn crops grown for canning in the Windsor (M.A.) district, where, as a result of the leaf damage, cobs filled poorly and yields were greatly reduced. Although the sweet corn hybrids grown are completely susceptible the crop is usually harvested before the disease becomes important. This year, however, the wet weather in late spring and early summer is thought to have favoured an unusually early outbreak.

BLACK COB ROT (Helminthosporium carbonum) was recorded on one cob of 21 x 7 pollinated with 25 x 23, adjoining the area in the Kempsey district (C.C.) where 25 x 23 was infected last year.

RUST (Puccinia sorghi) was again very common but rarely of importance. No evidence was found of Puccinia polysora which has been reported from northern Queensland.

ROOT-, STALK-, and COB-ROTS (Fusarium spp.) occurred widely as usual. The stalk rot phase was severe in a crop of Victory at Tabulum (N.C.) but was absent from adjoining crops of G.H. 128. The root rot phase occurred in the lines Wf9 x OH45 and C103 x HY in plots at Glen Innes (N.T.), apparently being favoured by the wet weather in late spring and early summer. The cob rots were often observed to follow insect injuries.

WALLABY EAR (virus?) was observed in three small plots in the Tweed (N.C.) district, affecting almost all plants. One of the crops was sweet corn.

SORGHUM

ROOT and CROWN ROT (Macrophomina phaseoli) was recorded from several places in the north-west. This disease is most troublesome when the plants are growing under conditions of moisture stress and soil temperatures are high, hence its prevalence in northern inland areas. In an irrigated crop at Berrigan (R.) the disease only occurred in bays which had received one less irrigation than the rest.

STUNT (undet.) was observed to be affecting approximately 1% of plants in a crop of Caprock at Berrigan (R.). The affected plants were both scattered and in patches up to 20 feet across and it was noted that there had been a heavy aphid infestation. Affected plants failed to flower and developed numerous shoots with chlorotic, inrolled and downturned leaves.

RICE

HEAT INJURY was recorded from Griffith (M.I.A.) and Deniliquin (R.) during an unusual heat wave in January. In the former case the outer leaves and sheaths died, presumably as a result of the heating of the upper layer of the water. In the latter case many spikelets had failed to set grain. An examination of these showed that the anthers had not dehisced and the ovaries had shrivelled.

SUGAR CANE

(Information kindly supplied by the Colonial Sugar Refining Company Limited).

During the 1959 crushing season in N.S.W., 574,527 tons of cane were crushed and it is estimated that only 212 tons were lost as the result of diseases.

EYE SPOT (Helminthosporium sacchari) is believed to be the most important disease in N.S.W. for 1959, causing a loss estimated at 100 tons.

RED ROT (Colletotrichum gramicola) decreased further, being responsible for an estimated loss of 84 tons.

LEAF SCALD (Xanthomonas albilineans) caused a loss estimated at 23 tons.

FIJI DISEASE (virus) caused a loss estimated at only 5 tons.

RATOON STUNTING (virus), MOSAIC (virus), CHLOROTIC STREAK (virus), PINEAPPLE DISEASE (Ceratocystis paradoxa), and TOP ROT (Fusarium moniliforme) also occurred. Ratoon stunting is being brought under control by the use of hot-water treated cane and pineapple disease is completely controlled by dipping the cuttings in an organic mercury fungicide. In 1959, cuttings used to plant 76% of the total area planted were treated.

MISCELLANEOUS GRASSES

BENT GRASS (Agrostis tenuis)

BROWN PATCH (Rhizoctonia solani) occurred as usual, but no records of severe damage were received.

DOLLAR SPOT (Sclerotinia homoeocarpa) was recorded as usual from the metropolitan area.

SEEDLING BLIGHT and FADING OUT (undetermined) were again common in seedling stands in the autumn. Oospores of Cladochytrium sp. and Olpidium brassicae were common in the roots of affected plants.

BLUE COUCH (Digitaria didactyla)

BROWN PATCH (Rhizoctonia solani, Helminthosporium sp. and Curvularia sp. associated) was severe on a lawn at East Maitland (C.C.). Blue Couch seems to be particularly susceptible to this condition and, in this instance, ordinary couch (Cynodon dactylon) colonised the bare patches.

BUFFALO (Stenotaphrum secundatum)

LEAF and STOLON SPOT (Piricularia grisea) caused serious deterioration of a metropolitan lawn in February during a period of hot, humid weather.

SLIME MOULDS developed extensively on a lawn in Gunnedah (N.W.S.).

CARPET GRASS (Axonopus affinis)

BROWN PATCH (Rhizoctonia solani and Curvularia sp. associated) occurred in an area at Coff's Harbour (N.C.) during February.

COUCH (Cynodon dactylon)

BROWN PATCH (Rhizoctonia solani). Authenticated records of this disease were rare.

DOLLAR SPOT (Sclerotinia homoeocarpa). There were no authenticated records of this disease, but no survey was made for it.

LEAF SPOT and MELTING OUT (Helminthosporium cynodontis) recorded causing serious damage to bowling greens at Sutherland and Ashfield (M.A.) and

Grafton (N.C.).

HYPARRHENIA HIRTA

HEAD MOULD (Epicoccum andropogonis) was conspicuous in the introduction Mk201 but not in Mk 69 some distance away. The presence of this mould usually indicates that the heads of grasses are infected with ergot, though no ergot fungus was found on the specimens examined.

KENTUCKY BLUE GRASS (Poa pratensis)

LEAF RUST (Puccinia sp.) was severe on a metropolitan lawn of Merion Blue Grass in July.

KIKUYU (Pennisetum clandestinum)

DYING OUT (undetermined) in patches which gradually increased in size was again present on the north coast, a severe occurrence being recorded as far south as Kempsey. The cause of this curious condition has still not been determined.

LEAF SPOT (Helminthosporium mediocre) was severe along the coast in late summer, several pastures on the north coast being unusually badly affected.

STRIATION (undetermined) was observed affecting all runners in a large patch at Uralba (N.C.). The appearance of the grass suggested that the condition was probably no more than a genetic variation.

SLIME MOULDS were recorded disfiguring an area at Coonabarabran (N.W.P.).

PHALARIS COERULESCENS

ERGOT (Claviceps purpurea) was recorded in an experimental plot at the New England Experiment Farm, Glen Innes (N.T.).

PHALARIS (Phalaris tuberosa)

ERGOT (Claviceps phalaridis) was recorded, as in the previous season, from seed samples grown in the south west. For the first time infected plants were seen in the field and these were interesting in that all spikelets in the heads were infected. This disease has not yet been recorded from northern N.S.W., although there were records of C. purpurea from the northern tablelands.

RYE GRASS, PERENNIAL (Lolium perenne)

ERGOT (Claviceps purpurea) was very severe in late spring and early summer in seed crops grown on the south coast. It is unusual for this disease to be troublesome on rye grass in N.S.W. but, no doubt, it was favoured by the unusually wet weather in late spring.

SPOROBOLUS SP.

FALSE SMUT (Helminthosporium ravenelii) was widespread as usual, and was reported as having been suspected of causing lameness in a steer at Upper Horton (N.W.S.) in July. It has been suspected of having a similar toxic effect in South Africa.

FIELD AND FODDER CROPS

CICER ARIETINUM

ROOT ROT (undetermined) was severe in a nursery row at Inverell (N.W.S.).

CLOVER, CRIMSON (Trifolium incarnatum)

BURN (Pseudoplea trifolii) was recorded on this host for the first time in N.S.W. from Comboyne (C.C.).

CLOVER, RED (Trifolium pratense)

BLACK STEM (Ascochyta imperfecta) was severe in the Kyogle (N.C.) district in late summer and caused a considerable reduction in productivity.

LEAF SPOT (Stemphylium sarcinaeforme) caused extensive killing of the leaves in a pasture at Horseshoe Creek (N.C.).

SOOTY BLOTCH (Polythrincium trifolii) was prevalent during early summer at Armidale (N.T.).

CLOVER, SUBTERRANEAN (Trifolium subterraneum)

STUNT (virus) occurred over a wide area of the State. A particularly heavy infection took place on the central coast, whole paddocks of Yarloop appearing red in late spring at Dungog. In spite of appearances, however, losses in these instances were small as the stands were infected late and had already provided good grazing. Several interesting phenomena were observed in these paddocks. The disease was observed to be less severe in stand continuously grazed than in adjacent ones strip grazed. It was thought that the denser growth which was allowed to develop on the latter areas may have been more favourable for the multiplication of the aphid vectors. The same explanation may have accounted for the fact that the disease appeared to be more severe in areas which had received superphosphate than in those which had not.

MOSAIC (virus) was reported from Walcha (N.T.) and Wyong (C.C.).

BROOMRAPE (Orobanche minor) now affects 700 acres of subterranean clover between Young and Wagga (S.W.S.). Seed from infected stands is not accepted for certification and care is taken to see that broomrape seeds do not become mixed with certified seed during cleaning.

RUST (Uromyces trifolii) was severe in spring in coastal districts, some stands of Mt. Barker being badly damaged late in the season.

LEAF SPOT (Cercospora sp.) was severe in patches in a trial area of Bacchus Marsh at Taree (C.C.).

ROOT KNOT (Meloidogyne sp.) was observed in several areas on the central and north coast.

BURN (Pseudoplea trifolii) caused considerable leaf damage in a stand of Clare at Gloucester (C.C.) in October.

HORMONE INJURY was reported from Leeton (M.I.A.) and Finley (R.) in October. The areas concerned had been sprayed with 2,4-D ester for weed control.

CLOVER, WHITE (Trifolium repens)

BURN (Pseudoplea trifolii) was conspicuous in many stands of the Ladino variety on the central and north coast.

ROOT KNOT (Meloidogyne sp.) was recorded from Bellingen (N.C.).

SLIME MOULDS were recorded on pastures in several localities. A species of Didymium was recorded on petioles of white clover at Dugnog (C.C.).

COTTON

There has been renewed interest in this crop and experimental work is in progress at Narrabri Experiment Farm (N.W.P.). Experimental crops have also been planted in southern N.S.W.

ANGULAR LEAF SPOT (Xanthomonas malvacearum) was common but not serious at Narrabri (N.W.P.) and also in a crop at Boeil Creek in the lower Murray region (W.D.). Lesions occurred on leaves, petioles and bolls.

VERTICILLIUM WILT (Verticillium dahliae) was quite common at Narrabri (N.W.P.).

MANGANESE DEFICIENCY was conspicuous in one corner of the quarantine area at Narrabri Experiment Farm.

HORMONE INJURY occurred widely at Narrabri Experiment Farm after drains had been sprayed with 2, 4-D for weed control. Cotton is extremely susceptible and symptoms appeared many weeks after the spraying was carried out.

COWPEAS (Vigna sinensis)

CHARCOAL ROT (Macrophomina phaseoli) affected 80% of plants in a 120 acre crop at Pallamallawa (N.W.P.) in December.

ROOT and CROWN ROT (Rhizoctonia solani) was prevalent in a crop of Poona at Dingo Creek (C.C.) in February.

CROTALARIA GOREENSIS

WITCHES' BROOM (virus?) was recorded at Yanco Experiment Farm (M.I.A.).

CROTALARIA LANATA

WITCHES' BROOM (virus?) was recorded at Yanco Experiment Farm (M.I.A.).

CROTALARIA SPECTABILIS

STEM and POD BLIGHT (Botrytis cinerea) resulted in a significant depression of seed yield in a $\frac{1}{4}$ acre plot at Narara (C.C.).

DOLICHOS LABLAB

LEAF SPOT (Cercospora cruenta) was recorded in a crop at Fairy Hill (N.C.).

LATHYRUS SATIVUS

WILT (virus?) was recorded in an experimental plot at Wagga (S.W.S.).

The primary shoot had died and there was some stem blackening and distortion.

LINSEED

FROST INJURY occurred in a crop at Spring Ridge (N.W.S.) in October. Some bolls and flower buds were killed and the leaves scorched.

CLUB HEAD (zinc deficiency) was recorded in September at Tamworth (N.W.S.) in patches in a crop growing under dry conditions.

LOTONONIS BAINESII

LEAF and STEM BLIGHT (Botrytis sp.) caused a 60% loss in an experimental plot at Grafton Experiment Farm (N.C.).

WITCHES' BROOM (virus?) was recorded at Yanco Experiment Farm (M.I.A.).

LUCERNE (Medicago sativa)

ROOT ROD (Pythium sp.) was recorded at Yanco Experiment Farm (M.I.A.) affecting 90% of plants in an irrigated stand in April.

CROWN ROT (undetermined) occurred widely during the wet weather of late summer, often after severe grazing.

ANTHRACNOSE (Colletotrichum trifolii) was recorded causing a severe die-back and crown rot at Graman (N.W.S.) and Tamworth (N.W.S.).

CHARCOAL ROT (Macrophomina phaseoli) occurred at Maitland (C.C.) in conjunction with white fringed weevil damage in April.

LEAF SPOT (Pseudopeziza medicaginis) was widespread as usual in coastal districts.

STEM NEMATODE (Ditylenchus dipsaci) caused damage throughout the autumn, winter and spring in a stand at Singleton (C.C.).

ROOT KNOT (Meloidogyne sp.) was recorded in an experimental plot at Bellingen (N.C.) The roots were only mildly infected whereas those of white clover growing amongst them were very severely infected. It may well be, as has been found in other countries, that lucerne is comparatively tolerant.

WITCHES' BROOM (virus) occurred, as usual, throughout the western districts.

FROST INJURY occurred at Galong (S.T.) at the end of September.

SLIME MOULDS were conspicuous in patches in a stand at Jerilderie (R.) in December.

LUPIN, NEW ZEALAND BLUE (Lupinus angustifolius)

STEM CANKER (Rhizoctonia solani) occurred in a stand grown for seed at Wallacia (M.A.).

MANGANESE TOXICITY was severe in the same stand. The soil was very acid and liming was recommended.

DISTORTION and STUNTING (broad bean vascular wilt virus?) was observed at Parramatta (M.A.).

MEDIC (Medicago glutinosa)

WITCHES' BROOM (virus) occurred at Yanco Experiment Farm (M.I.A.).

MEDIC, BARREL (Medicago tribuloides)

RUST (Uromyces striatus) was severe on seedlings at Tamworth (N.W.S.).

PEANUT (Arachis hypogea)

LEAF SPOT (Cercospora sp.) was very severe in a 3-acre crop at Alstonville (N.C.) in April.

STEM and NUT ROT (Sclerotinia sclerotiorum) occurred at Curlwaa (W.D.).

PHASEY BEAN (Phaseolus lathyroides)

STEM CANKER (Ascochyta phaseolicola) was recorded in a trial at Upper Orara (N.C.).

SAFFLOWER (Carthamus tinctorius)

FROST INJURY was responsible for the death of approximately 5% of plants in a trial plot at Illabo (S.W.S.) in October.

SOYBEAN (Soja max)

BACTERIAL PUSTULE (Xanthomonas phaseoli var. sojense) occurred on Leeton Experiment Farm (M.I.A.).

TOBACCO (Nicotiana tabacum)

BLUE MOULD (Peronospora tabacina) has again been the most severe disease and it is estimated that on some farms between 30 and 50% of the crop was destroyed by this fungus.

ROOT KNOT (Meloidogyne spp.) was reported in several seed beds early in the season and several growers failed to get good control in the field using ethylene dibromide as a soil fumigant, probably because of inefficient application. Almost all farmers applied ethylene dibromide to their tobacco lands.

BLACK STEM ROT (Pythium aphanidermatum) was reported among the disorders affecting tobacco on the north west slopes.

DAMPING OFF (Pythium sp. and Phytophthora sp.) occurred as usual and some growers caused damage by applying Cheshunt Compound which had probably been mixed incorrectly by a supplier.

LEAF SPOT (Ascochyta sp.) was reported, as also was MOSAIC (tobacco mosaic virus).

FROST INJURY is believed to be responsible for poor germination where frosts occurred soon after sowing.

HAIL storms were responsible for considerable damage again this season and it is often the same farms that are affected each year.

VETCH (Vicia sativa)

WILT (virus?) was serious at Dorrigo, Kyogle and other areas of the north coast. Plants showed death of the primary shoot, stem blackening and stunting. In some cases many of the plants died.

STEM ROT (Colletotrichum sp.). Crops on the north coast were notably free from this disease which caused considerable damage last year.

CANE FRUIT.

No records.

CITRUS FRUIT.

Following mild winter conditions in coastal New South Wales, abnormal rains were received in October and November making spring spraying difficult. This was followed by extreme heatwave temperatures throughout the State in January. Autumn weather was drier than average in coastal sections. Heatwave conditions were experienced during November in the M.I.A.

DISEASES CAUSED BY PARASITIC FUNGI.

PHYTOPHTHORA ROOT, COLLAR and FRUIT ROT (Phytophthora citrophthora). Collar rot was reported from a number of orchards in coastal areas following unusual spring rains. At Trentham Cliffs (W.D.) very severe collar rot developed in 12 year old Valencia oranges on sweet orange stock growing under sod culture as a result of excessive overhead watering.

Infection of fallen fruit and some low hanging fruit of Valencia orange occurred in November in Wyong district orchards (C.C.).

BLACK SPOT (Guignardia citricarpa). Under central coast conditions black spot was not serious in the early spring. Lower than average spring and early summer temperatures together with showery conditions were not conducive to early black spot development.

A slight to moderate amount of disease occurred in Hills district (M.A.) orchards in September and by November quite severe losses had been reported in some orchards and also in the Gosford district (C.C.) where spraying had been inadequate or poorly timed. Late hanging Washington navels showed heavy disease development in early September at Glenorie (M.A.). SPECKLED BLOTCH was seen causing minor damage to Washington navel oranges in Hawkesbury River orchards in July, 1959. In April-May, 1960, an unusually heavy development of speckled blotch occurred in many Hawkesbury R. orchards and at East Kurrajong causing losses of up to 80% in some cases. In addition to Washington navel, Joppa and Valencia oranges, grapefruit and Emperor mandarins were affected. The outbreak followed shortly after a period of unseasonably hot weather in early April. Conditions for spray applications were not favourable in the early summer and considerable infection undoubtedly occurred then.

MELANOSE (Diaporthe citri). Melanose infection was not abnormally severe on main crop fruit in coastal orchards though some leaf and fruit infection was reported from the central coast. Continuous wet weather which occurred during spring was not as favourable to infection by this disease as is intermittent rain with periods of dry weather. Autumn infection of foliage was negligible. Branch dieback was reported from Cornwallis (M.A.). At

Coomealla (W.D.) a few young trees obtained from a coastal nursery developed branch blight, the lesions originating under wrappings put on for frost protection. In spray trials at Dooralong (C.C.) copper oxychloride and cuprous oxide alone failed to protect young fruit from melanose infection whereas with the addition of ½% white spraying oil these materials were quite satisfactory.

Diaporthe citri was an important cause of stem-end rot in harvested fruit of Valencia orange during mid to late summer months. Losses appeared to be correlated with age of orchard, being unimportant in fruit produced on young trees. Spraying for black spot control does not appear to reduce stem-end rot losses, although it does give good control of the melanose phase of the disease.

SCAB (Sphaceloma fawcettii scabiosa). Main crop setting was rather light in most coastal lemon districts, following very heavy crops in 1958. Scab was reported to be fairly severe in orchards where spraying was delayed by wet weather. Intermediate crops set during late summer and autumn were fairly free of disease. Scab development was noted to be widespread in nurseries in the Metropolitan (M.A.) and Gosford districts (C.C.).

BROWN SPOT (suspected Alternaria sp.). Some slight to moderate infection of spring foliage occurred in young trees in the Hawkesbury R. district (M.A.) but losses of fruit were light. Severe spring infection of Emperor mandarins occurred at Narara, Mangrove Mountain, Somersby and Wyong (C.C.) resulting in shoot blight and heavy fall of crop. Shoot blighting of San Jacinto tangelo was observed at Narara (C.C.) and infection of rough lemon, Calamondin and Wheeny grapefruit was also recorded.

SEPTORIA SPOT (Septoria depressa). No reports of serious damage in M.I.A. and Murray R. (R. and W.D.) orchards have been received.

SOOTY BLOTCH and FLY SPECK (Gloeodes pomigena and Leptothyrium pomi) was reported to be generally severe in late hanging Washington navel oranges in Gosford lowland orchards (C.C.).

ARMILLARIA ROOT ROT (Armillaria mellea). Losses of 1 year old trees were reported from Lower Portland in early spring 1959. Armillaria had become established in sections of dead reed rhyzome following clearing of old citrus trees and had invaded young trees from this source. The disease continues to cause losses in orchards at Hawkesbury R., Maroota (M.A.), Peat's Ridge, Mt. White, Kulnura and Somersby (C.C.).

SUDDEN DEATH (suspected Coprinus sp.). A 15 year old tree which had been affected with this disease was found to be recovering in a Dooralong orchard (C.C.). The secondary invasion by a species of Polystictus appeared to have eliminated the original invader. Heavy losses of 8-9 year old Emperor and Dancy mandarins on trifoliata stock were reported from a Trentham Cliffs orchard (W.D.). Both field budded and nursery budded trees were affected. No losses in 5 rows of trees on Cleopatra stock interplanted with the trees on trifoliata had occurred, nor had any trees on sweet orange stock in adjacent blocks been affected. Losses of 4 year old and 20 year old trees of Unshiu on trifoliata stock were reported from Black Hill (C.C.).

RHIZOCTONIA COLLAR ROT (Rhizoctonia solani). An overall loss of about 5% of seedlings of rough lemon occurred during spring 1959 in Carlingford nurseries (M.A.). Heavy losses of trifoliata and Carrizo citrange occurred at the Lower Murray Research Station, Dareton (W.D.).

VIRUS DISEASES.

SCALY BUTT (Exocortis virus). This disease was reported to have developed in a tree of Orlando tangelo on trifoliata stock at the Lower Murray Research Station. The budwood for this and other trees of Orlando which appear to be free of the disease was obtained from trees on sweet orange and rough lemon stock grown at Narara, but all are thought to have originated from a single budstick imported from the U.S.A.

SHELL BARK (suspected Exocortis virus) was prevalent as usual in old line Eureka and Lisbon lemons. No shell bark could be found in two large blocks of 24 year old lemons, which appear to be of nucellar origin, in Kenthurst orchards (M.A.).

FLORIDA GUMMOSIS (suspected virus). No fresh occurrences have been observed.

XYLOPOROSIS (virus). Symptoms of this disease were observed in 3 year old off-type navel oranges on rough lemon stock at Grose Vale (C.T.).

WOODY GALL (virus). A prominent development of woody gall was observed on rough lemon stocks of yearling Frost Eureka nucellar trees at the Lower Murray Research Station. Budwood had been taken from trees which were budded to suckers after removal of declining Ellendale tops so it is not known with certainty whether the infection was introduced with the budwood or from the Ellendale. Severe woody gall was reported from the Wollongong district (S.C.) on naturalised seedling rough lemon.

STEM PITTING (virus). No further developments.

TRISTEZA (virus). No further developments.

CRINKLE LEAF (virus). No further developments.

PSOROSIS (virus). No further developments.

ROUGH LEMON DECLINE (suspected virus). No further developments.

OTHER DISORDERS.

CITRUS ROOT NEMATODE (Tylenchus semi-penetrans). Growers in the central coast are becoming increasingly aware of the widespread distribution of this pest on citrus roots as a result of the recent impetus to underground drainage, particularly in the lighter soil type of the Mangrove Mountain-Kulnura areas. The pest is probably no more serious than formerly, however an accurate assessment of the crop losses occasioned by it is difficult to obtain.

YELLOW LEAF (Magnesium deficiency) was widespread in coastal orchards. It was reported also from Gilgandra (C.W.S.), Coonamble (C.W.P.) and Armatree (C.W.S.).

EXANTHEMA (Copper deficiency). Mild to moderate symptoms were reported from orchards at East Kurrajong (C.T.) and Coonamble (C.W.P.).

MOTTLE LEAF (Zinc deficiency). Slight to moderate development of this disorder was reported from several Hawkesbury R. and Hills district orchards (M.A.) and from Ourimbah, Somersby and Mangrove Mountain (C.C.). It was prevalent as usual in the south west part of the State (M.I.A., R., W.D.), and was noted at Gilgandra (C.W.S.), Coonamble (C.W.P.) and Bourke (W.D.).

ACID SPOT (excess manganese uptake) was reported affecting Washington navel orange trees on trifoliata at Curlwaa (W.D.) growing in soil of pH 4.6, on mature Washington navel and Valencia trees on trifoliata stock at Dooralong (C.C.), in soil of pH 4.2-4.4 and on nursery trees at Ermington (M.A.) and Narara (C.C.).

MANGANESE DEFICIENCY. Moderate symptoms were shown by grapegruit, Washington navel orange and mandarin on sweet orange stock at Coomealla (W.D.).

YELLOWS (cause not known). The occurrence of this disorder has been much less than last year, but scattered cases have been reported particularly in the Windsor district (M.A.) and in vigorously growing young Valencia and Washington navel oranges at Kulnura, Narara, Somersby and Mangrove Mountain (C.C.). A somewhat similar disorder occurred on a few three-year old Ellendale mandarins on trifoliata at Coomealla (W.D.) and on about 5% of trees in a two acre block of Dancy mandarins on Carrizo citrange at Curlwaa (W.D.). In both these cases yellowing commenced in January after heatwave weather.

MANDARIN SCALD (suspected lack of balance between N & K). Crops carried by Emperor mandarins in coastal orchards were generally much lighter than in 1959, and no cases of severe scald have been reported.

COLD INJURY. Rough lemon stocks at the Lower Murray Research Station (W.D.) showed yellowing of young growth following a period of low temperature after early warm spring weather.

WATER SPOT. Appreciable development of water spot was reported in Washington navel oranges in winter 1959 in the central coast citrus districts. It is possible that there is a relation to June application of quick-action fertilizers

BORON TOXICITY was reported in winter 1959 to be affecting citrus at Coomealla (W.D.).

YELLOW RING (unknown cause). One 3 year old tree of Parker mandarin on Carrizo citrange was observed to show this disorder in a Curlwaa orchard (W.D.). Other trees of the same age, stock and bud source were unaffected.

SHOOT BLIGHT (Developmental abnormality). This disorder was less noticeable than usual in metropolitan nurseries (M.A.).

A DECLINE. Scattered eight year old Valencia oranges on sweet orange stock in a Curlwaa orchard (W.D.) started to yellow and lose leaves in summer 1958, and made poor growth in the following year. Fruit was small and markedly oblong, with thin rind at the stylar end, closely resembling descriptions of "stubborn" affected fruit. Flavour, however, was good, whereas "stubborn" affected fruit are said to be bitter.

A BLIGHT-LIKE DISORDER (Unknown cause). Two twenty-year old trees of Valencia orange on trifoliata stock in a Dooralong orchard (C.C.) have shown symptoms very closely resembling those of citrus blight, with the difference that the trees after 3 or 4 years of progressive die-back appear to throw off the disease and recover completely.

PAVEMENT FUNGUS (unidentified basidiomycete). Extensive development of a pavement-fungus type round lemon trees in a Bourke (W.D.) orchard appeared to affect adversely the health of the trees, possibly by interfering with

water movement.

PUFFY FRUIT. Crops of Washington navels generally were very early in maturing in coastal orchards and the incidence of creasing and puffing was very much greater than usual.

POME FRUIT

APPLE:

BLACK SPOT (Venturia inaequalis) was well controlled at Batlow (S.W.S.) and Orange (C.T.) except for some "late spot" which developed on Granny Smith. The spray warning service was again operated in these two districts. Severe infection occurred at Penrose (S.T.), Shipley (C.T.) and Tallong (C.T.). Heavy infection occurred in many orchards in the Camden (S.C.) district, in the Metropolitan Area and on the Northern Tablelands especially at Uralla and to a lesser extent at Kentucky. Some infection occurred early in the season at Young (S.W.S.)

Recommendations for the use of an eradicant mercury treatment in the immediate post-harvest period were released this season and many growers, especially on the Northern Tablelands and to a lesser extent at Camden, made use of this new method of inoculum reduction.

POWDERY MILDEW (Podosphaera leucotricha) continues to be a major problem on the highly susceptible varieties Jonathan, Rome Beauty, Gravenstein and Kirks. Infection this season, however, was less severe than last season, due possibly to the more widespread use of wettable sulphur mixed with organic fungicides for black spot control.

LIMB CANKER AND DIEBACK (Botryosphaeria ribis). Despite the extreme heatwave conditions which occurred in January, losses from this disease were not extensive. This is probably due to the fact that soil moisture was at a satisfactory level at the time of the record heatwave. The disease still remains confined to the coastal districts. It is causing some concern to growers new to apple growing in the Gosford district (C.C.).

BITTER ROT (Glomerella cingulata). Heavy infection occurred in many orchards in the Metropolitan Area and in the Camden-Oakdale-Lakesland District (S.C.), and at Gosford (C.C.). Some growers experienced serious losses.

Where a copper spray was applied in the pre-pink period and followed by the recommended thiram schedule control was fairly satisfactory. Field evidence indicated that the pre-pink copper spray contributed significantly to control.

The season was very favourable for infection in that the spring was wet and the summer hot and humid. The varieties most severely affected were Willie Sharp, Gravenstein, Granny Smith, Jonathan, McIntosh Red and Trevitt.

STEM ROT (Sclerotium rolfsii) caused some heavy losses in nurseries in the Metropolitan Area, and killed several young trees in orchards at Griffith (M.I.A.) and in the Metropolitan Area.

SOOTY BLOTCH (Gloeodes pomigena) was prevalent in the Camden district (S.C.) and at Tenterfield (N.T.). Some growers had to dip their fruit.

PHYSIOLOGICAL DISEASES. Bitter pit was very prevalent throughout the State. In a black spot experiment at Orange it was found that fruit

sprayed with lime sulphur was almost free of bitter pit compared with the heavy incidence which occurred in fruit sprayed with organic fungicides. The former fruit was restricted in size. Crinkle or early surface water-core breakdown was fairly prevalent at Camden (S.C.) and in the Metropolitan Area following the record heatwave in January. Jonathan spot was again prevalent on Jonathan and some other red apples left too long on the trees, especially in the hotter districts.

FLAT LIMB (?virus) was recorded at Bathurst Experiment Farm (C.T.) on seedling material of the cross Granny Smith x Stayman which had been top worked onto the variety Babbit. The symptoms of flat limb also developed strongly on scion growth of the variety Lalla worked on Twenty Ounce at Orange (C.T.).

RING SPOT (virus) was found to occur in almost every district. Symptom expression was quite pronounced this season.

GREEN CRINKLE (virus). Symptoms of green crinkle failed to develop this year to any extent in trees which showed symptoms freely last season.

MOSAIC (virus) occurred throughout the State, being particularly prevalent on Jonathan.

WOOD ROTS (Polystictus spp. and Schizophyllum commune) continued to invade trees damaged by sunscald, fire and Botryosphaeria canker.

MEASLES (undet.) was prevalent, particularly on Delicious, on trees affected by root injury or severe malnutrition. It has frequently been found that the roots of trees showing pronounced measles symptoms have been very severely damaged by root weevils.

BURR KNOT (undet.) was observed on an 8 years old apple seedling at Lane Cove (M.A.). This condition is rather common on Willie Sharp trees.

FLECK (Fabraea maculata) occurred on Malus spectabilis at Pennant Hills (M.A.).

PEAR

BLACK SPOT (Venturia pyrina). The incidence of black spot on pears was similar to that on apples, except that some black spot developed in a few pear orchards at Leeton (M.I.A.). Black spot was not observed on apples in that district.

BLAST (Pseudomonas syringae). Infection was fairly widespread especially at Orange (C.T.) and Batlow (S.W.S.). Field observations suggest that frost may have been a predisposing factor to the infection.

BROWN ROT (Sclerotinia fructicola) occurred on damaged pears at Yanco (M.I.A.).

QUINCE

FLECK (Fabraea maculata) was of severe and widespread occurrence.

BURR KNOT (undet.) was prevalent as usual.

BROWN ROT (Sclerotinia fructicola) was observed on quinces damaged

by insect activity at Griffith (M.I.A.) and at Young (S.W.S.).

STONE FRUIT

ALMOND

SHOT HOLE (Clasterosporium carpophilum) was again prevalent. At Young (S.W.S.) good commercial control was again obtained from the application of a single dormant spray of the eradicant fungicide phenyl mercuric chloride.

RUST (Tranzschelia pruni-spinosae). was prevalent on almond trees in most districts.

VIRUS. A leaf pattern suggestive of plum line pattern infection was observed at the Wagga Agricultural College (S.W.S.).

APRICOT

BACTERIAL CANKER (Pseudomonas syringae) was active in the spring especially in the coastal and tableland districts.

BROWN ROT (Sclerotinia fructicola). No serious losses from brown rot occurred this season although substantial infection occurred in some small tableland orchards.

SHOT HOLE (Clasterosporium carpophilum) was prevalent on the M.I.A. wherever early blossom and shuck fall sprays were omitted. Infection was again severe in coastal districts, and the disease caused some losses in tableland crops. In experiments at Wiseman's Ferry (M.A.), Young (S.W.S.) and Orange (C.T.) excellent commercial control of shot hole resulted from a single dormant or semi-dormant spray of the eradicant fungicide phenyl mercuric chloride.

FRECKLE (Fusicladium carpophilum). Heavy infection was recorded at Tumut (S.W.S.) and in coastal and near coastal districts.

RUST (Tranzschelia pruni-spinosae). Heavy infection occurred in the Metropolitan Area and at Koraleigh (R.). The infection at Koraleigh was severe on Case's Early, light on Glengarry and only a trace occurred on Caselin.

LEAF CURL (Taphrina sp.) again occurred at East Kurrajong (C.T.) and it was also recorded at Quirindi (N.W.S.).

BLACK HEART (Verticillium dahliae) was recorded at Rylstone (C.T.) and Young (S.W.S.).

INTERNAL BREAKDOWN (Physiological) was recorded at Forbes (C.W.S.).

CHERRY

BACTERIAL CANKER (Pseudomonas syringae). Heavy infection was recorded at Young (S.W.S.).

BROWN ROT (Sclerotinia fructicola). Slight infection occurred in early cherry crops at Armidale (N.T.). Very little infection occurred in the main cherry districts Young (S.W.S.) and Orange (C.T.).

SHOT HOLE (Clasterosporium carpophilum and Cercospora circumcissa). Infection by the latter fungus was more common than usual. Shot hole was of general occurrence but no fruit loss was recorded.

BACTERIAL SPOT (Xanthomonas pruni) was recorded at Kingsvale (S.W.S.) on St. Margaret cherry fruit for the first time in N.S.W. The infection was observed in late November when the fruit was about 2 weeks from maturity. A reduction in yield of about 75% was recorded but hail damage was associated. The disease was also reported to have caused losses in Ron's Seedling cherries in another orchard in the Young district and to have occurred on occasional fruit throughout the district.

VIRUS DISEASES and VIRUS-LIKE CONDITIONS. The position remained unchanged except that a condition believed to be due to tatter leaf virus infection was found to be much more widespread than previously thought. A scion overgrowth and subsequent dieback condition of Eagles Seedling and to a lesser extent of St. Margaret, Ron's Seedling and Burgsdorf worked on Mahaleb stock at Yonng (S.W.S.) is thought possibly to be due to virus infection.

ROOT LESION NEMATODE (Pratylenchus sp.). A high population of root lesion nematodes was found to exist in the soil around the roots of seriously stunted cherry trees growing on old apple land at Young (S.W.S.).

CHERRY LEAF SPOT (Coccomyces hiemalis). A survey of the State failed to reveal any evidence of this disease which has now not been seen since 1951 following successful eradication and quarantine measures implemented in 1950 and 1951 after outbreaks in a number of nurseries in the Metropolitan area.

NECTARINE

BROWN ROT (Sclerotinia fructicola). Some substantial losses occurred in coastal districts. In some cases severe brown rot infection occurred on fruit split as a result of intense freckle infection.

FRECKLE (Fusicladium carpophilum). The wet spring favoured freckle infection and some very heavy losses occurred in coastal districts.

RUST (Tranzschelia pruni-spinosae). Heavy infection occurred on trees which were not adequately protected. Heavy infection of fruit was recorded at Young (S.W.S.).

LEAF CURL (Taphrina deformans). Heavy infection occurred on inadequately sprayed trees.

PEACH

BROWN ROT (Sclerotinia fructicola). Infection was very slight this year on the M.I.A., even on hail-damaged fruit. Heavy losses occurred in some orchards in coastal districts and some losses occurred in the earlier varieties in the Armidale (N.T.) district.

ROOT ROT (Phytophthora cinnamomi) continued to cause some losses in poorly drained orchards and in some nurseries.

RUST (Tranzschelia pruni-spinosae). Infection was severe in coastal and near-coastal districts especially in early maturing varieties where spraying for rust control was discontinued after harvest. Some fruit infection was recorded at Young (S.W.S.).

LEAF CURL (Taphrina deformans). Severe infection was reported from all districts. The mild spring and early bud movement may have resulted in many spray applications being too late to give maximum control.

FRECKLE (Fusicladium carpophilum). Heavy infection occurred in coastal districts wherever the recommended schedule was not closely followed. The spring was wet and favoured heavy infection. The disease was also recorded at Bathurst (C.T.).

SHOT HOLE (Clasterosporium carpophilum). Infection was general but no fruit loss was reported.

CROWN GALL (Agrobacterium tumefaciens) continued to be a problem in nurseries.

BACTERIAL SPOT (Xanthomonas pruni) was recorded this season on peaches for the first time in N.S.W. There was a severe occurrence of the disease in one orchard at Bathurst (C.T.) and less severe incidence in two orchards at Orange (C.T.). The varieties Frome, Dripstone, Success, J.H. Hale, Halehaven, Grays and Wiggins were involved. A rapid survey of the State was carried out after the initial diagnosis at Bathurst towards the end of the season, but no further evidence of the disease was detected.

WOOD ROTS (Polystictus spp. and Schizophyllum commune) again caused the rapid decline and death of old peach trees which had been sun-scalded.

WIND INJURY. Severe wind burn, possibly associated with salt damage, occurred on peach trees exposed to strong south-easterly winds in locations near the coastline between Wollongong (S.C.) and Newcastle (C.C.) during the late spring.

PLUM

BROWN ROT (Sclerotinia fructicola) caused some substantial losses in coastal districts during hot humid weather in December. Some losses also occurred in the earlier varieties on the Northern Tablelands.

RUST (Tranzschelia pruni-spinosae). Severe infection and premature defoliation occurred in early coastal varieties where spraying schedules were not continued after harvest. Excellent control of rust on prunes was again evident at Young (S.W.S.) wherever the recommended zineb plus white oil schedule was applied. Heavy infection occurred on non-sprayed trees towards the end of the season.

BACTERIAL SPOT (Xanthomonas pruni). The incidence of bacterial spot was very severe on susceptible varieties in all districts. This disease was found to be more widespread than previously believed.

SHOT HOLE (Clasterosporium carpophilum). Infection was general. Heavy infection was reported on Angelina plums on the Northern Tablelands.

LINE PATTERN (virus) was reported on occasional trees from most districts.

TROPICAL FRUITS

AVOCADO

RIPE ROT (Gloeosporium sp.) caused significant loss of fruit in two areas at Duranbah (N.C.). Losses in transit to the Melbourne market were also considerable July, 1959.

ROOT ROT (Phytophthora cinnamomi) was again responsible for the death of mature trees at Duranbah (N.C.).

BANANA

LEAF SPOT (Cercospora musae). Early infection was evident in the Richmond River valley (N.C.) during late November following a very wet spring. An unusually dry January to May period was reflected in an overall lower incidence of the disease during the late autumn and winter period than in the three preceding years. In some areas, however, considerable defoliation took place and bunches from plants denuded of foliage were harvested as early as May. A regular three-weekly misting with oil gave satisfactory control of the disease in all areas.

BUNCHY TOP (virus). Records compiled by the Division of Horticulture show that a total of 1,829 infected plants were detected during the year. This is a decrease of 263 detections on the preceding year. Detections of Bunchy Top infected plants for the four preceding years have been : 1955-56, 3159; 1956-57, 4500; 1957-58, 3925; 1958-59, 2692.

Two plantations chronically infected with Bunchy Top were destroyed in the Clarence area (N.C.) thereby making the Richmond River the southern boundary of known Bunchy Top occurrence in the State.

SPECKLE (Sphaerella musae) assumed major importance as a defoliating disease where, especially in the Richmond area (N.C.), many bunched plants were rendered leafless by June despite frequent oil misting. Perithecia of the causal fungus appeared to develop abundantly throughout the year on leaf trash, especially on the plantation floor, in all areas.

ROOT ROT (Radopholus similis). Root loss, unthriftiness and poor anchorage of plants in the soil due to the burrowing nematode, are now recognised throughout the growing areas of the north coast. Trimmed planting material used was invariably infected with R. similis. Soil samples assayed from areas which had previously not grown bananas did not contain the nematode, whilst large populations infested soil surrounding falling plants.

Planting material disinfested by a thermotherapeutic treatment will be available for planting into virgin land or land freed of bananas for in excess of 10 years during the 1960-61 planting season.

STEM ROT (Marasmius sp.) was identified from plantations at Clothier's Creek and Dungay (N.C.) where in areas of the plantations affected stools had been considerably weakened.

CUCUMBER MOSAIC (virus). Infectious chlorosis affected small numbers of plants over a wide area. The most significant outbreak of the disease was at Tuntable (N.C.) where a $1\frac{1}{4}$ acre plantation of Williams bananas established 9 months earlier, was destroyed because of a high incidence of the disease.

SQUIRTER AND BLACK END (Nigrospora sphaerica, Gloeosporium musarum). Good control of both diseases was again maintained by salicylanilide fruit dipping. During the summer months considerable losses from Black End were reported from all markets. Regulations requiring dipping of fruit throughout the year in salicylanilide have been enacted. Because of the greater stability of the sodium salt of salicylanilide and its slightly greater fungicidal efficiency this compound is now recommended preferentially for fruit dipping.

PANAMA DISEASE (Fusarium oxysporum cubense). Severe infection of plantain bananas was reported from Esk Island, Clarence River, (N.C.).

CORM ROT (Armillaria mellea) was reported sporadically from north coast areas.

CORKY SCAB (Cause undet.). This condition was reported to be causing sporadic losses in the Coff's Harbour-Macksville districts (N.C.) during the 1959 winter. Soil applications of boron gave no conclusive results.

STEM END ROT (Thielaviopsis sp.). A consignment of bananas from the Tweed River area (N.C.) to Adelaide was rejected because of the severe development of Stem End rot.

CIGAR END (Stachylidium theobromae). This disease was evident in November harvested bunches in both the Lismore and Macksville areas (N.C.).

ANTHRACNOSE (Colletotrichum sp.). Severe ripe rot was responsible for the rejection of several consignments of bananas to southern markets in May, 1960. Cold weather conditions prior to picking may have predisposed the fruit to the disease.

PREMATURE YELLOWING OF LEAVES. This condition observed in both Tweed and Richmond (N.C.) plantations caused considerable concern in July and August, 1959. The condition was usually reported from plantations which had received from 4 to 7 applications of misting oil plus a copper fungicide during the preceding January to April period. A few heavy frosts in an otherwise exceptionally mild winter may have been prime factors responsible for the yellowing and defoliation reported. In one instance at Limpinwood (N.C.) an adjacent plantation where Bordeaux mixture had been used did not show this effect.

COLD INJURY. Two severe frosts in mid August, 1959, resulted in injury to a large area of bananas in marginal areas in Coff's Harbour-Macksville districts (N.C.). Losses through chilling injury have been even more extensive during the more severe winter of 1960.

PINEAPPLE

WILT (Cause undetermined). The wet weather of winter and spring 1959 resulted in widespread development of wilt in the Richmond and Tweed River areas. Production was considerably reduced and fruit size poor. Most plantations sustained considerable losses.

A severe outbreak of wilt was reported from a plantation of Smooth Cayenne at Port Macquarie during winter 1960.

PAPAW

RIPE ROT OF FRUIT (Colletotrichum sp.) as usual affected fruit, particularly during winter and spring months.

POWDERY MILDEW (Oidium sp.). Widespread and severe infection of home garden plants was reported from the Murwillumbah district (N.C.).

PASSIONFRUIT

WOODINESS (Cucumber mosaic virus). This disease was again prevalent in all passionfruit growing areas.

BROWN SPOT (Alternaria passiflorae). Following wet weather in early spring brown spot was reported from a number of central coast localities and from Berry (S.C.) and Lismore (N.C.) causing severe injury. The disease decreased in importance with the onset of drier summer conditions. Late autumn and early winter infection was serious at Avoca, Kulnura and Peat's Ridge (C.C.). Spraying at this time appeared to be of very limited value as compared with early autumn application.

FUSARIUM WILT (Fusarium oxysporum f. passiflorae). This disease continued to be serious in areas where it was already established. Two new localities were recorded at Peat's Ridge and Kulnura (C.C.). This disease is slowly spreading in the Kulnura-Peat's Ridge area of the central coast and could be an extremely important factor in limiting passionfruit production.

EELWORM (Meloidogyne sp.). Some severe infestations were observed at Somersby and Kulnura (C.C.). Affected vines appeared undernourished and unthrifty and leaves exhibited marginal scorch with chlorotic appearance.

MISCELLANEOUS FRUITS

FIG

ROOT KNOT (Meloidogyne sp.). Very heavy infestation of year old cuttings was reported from Hawkesbury Agricultural College (M.A.).

GRAPES

DOWNY MILDEW (Plasmopara viticola). In coastal areas almost continuous rain during part of October and November encouraged vigorous growth and impeded spray applications. Very severe leaf damage due to downy mildew attack occurred in some metropolitan vineyards, notably at Orchard Hills and also in the Hunter River area (C.C.) where growers were unable to spray adequately. Losses of fruit however were not great in the metropolitan area and were partially compensated for by increased size of berries. In some Hunter River vineyards, however, complete loss of crop and spring foliage occurred, and the overall reduction due to downy mildew, plus hail, which fell in December, was estimated at 50%. Much drier weather followed and disease control during summer and autumn was good. Downy mildew was more severe than for many years in the Richmond R. district (N.C,).

In Tableland and M.I.A. vineyards downy mildew was not a problem, due to increasingly dry conditions during most of the growing season.

At Koraleigh (R). downy mildew appeared in February but caused little damage. It was well controlled by copper oxychloride and Bordeaux

mixture.

No disease development took place at Corowa (R.), where drought conditions have prevailed for several years.

BLACK SPOT (Elsinoe ampelina). This disease was well controlled in most vineyards. Some heavy infection was reported from Koraleigh (W.D.) and Griffith (M.I.A.) in spring on unsprayed vines. The disease became active in February at Koraleigh and in a few Coomealla vineyards (W.D.), but mostly affected young growth and caused little damage.

POWDERY MILDEW (Uncinula necator). This disease was generally well controlled and no reports of damage were received.

DEAD ARM (Phomopsis viticola). Spring infection of susceptible varieties was again heavy in Griffith vineyards (M.I.A.). Damage to canes, bunch stalks and foliage occurred. Application of sodium arsenite as a dormant spray resulted in almost complete elimination of the disease.

FRUIT ROTS. Weather during summer and early autumn was generally warm and dry and no reports of fruit rotting were received.

CANE BLIGHT (Pythium sp.). This disease, causing blighting of young green canes of Palomino, again occurred in a Coomealla vineyard (W.D.).

LEAF SPOT (Botrytis cinerea). Some foliage injury due to this disease occurred in a Hunter River vineyard (C.C.) affecting Black Muscat, following continued wet weather in October.

ROOT KNOT (Meloidogyne sp.). Moderate infection of rooted cuttings was reported from Hawkesbury Agricultural College (M.A.), Coomealla (W.D.) and Griffith (M.I.A.).

LEAF ROLL (virus). Leaf roll symptoms were seen in a small percentage of vines of the varieties Monbaden and Grenache in a Corowa (R.) vineyard, and all vines of the varieties Grand Noir and Alicante Bouschet. Symptoms very suggestive of leaf roll were seen in Black Muscat in an Orchard Hills vineyard (M.A.).

MEASLES (Cause unknown). Unlike 1959 when measles symptoms were very general in most grape growing areas, this disease was little in evidence, except in a few Coomealla vineyards (W.D.) where severe leaf burning, defoliation and fruit scald of sultanas occurred in late summer.

BUNCH STEM DIEBACK (Cause unknown). This disorder again caused losses of up to 60% of fruit of Black Muscat in Orange district (C.T.) vineyards.

SALT INJURY was apparent in irrigated vineyards at Griffith (M.I.A.), Coomealla (W.D.), Curlwaa (W.D.) and Tocumwal (R.). At Corowa (R.) in unirrigated vineyards where extreme drought conditions have been experienced salt damage was very extensive in old vineyards where it had never previously been seen. This area experienced waterlogging following unusual rains in 1956 and the present occurrence is attributed to this.

HEAT EFFECT. Crops in the Corowa-Barooga (R.) area were estimated to be reduced by 1/3 or more as the result of hot weather in November, which interfered with pollination. Sun scalding of grapes, chiefly Cornichan and Gordo, occurred during heatwave weather at Griffith (M.I.A.) in January, the bunch stems were also browned, and vascular browning occurred even when colapse of bunch stem had not occurred.

HAIL LOSSES. Hail storms at Pokolbin and Branxton in the Hunter R. area (C.C.) during January caused severe losses, in one vineyard amounting to 20,000 gallons of wine.

HEN AND CHICKEN. Wet weather at blossoming was responsible for poor setting of some Black Muscat at Camden (M.A.) and Traminer at Cessnock (C.C.). Minor damage was noted in other varieties.

MANGANESE DEFICIENCY. Symptoms suggestive of manganese deficiency were observed in Doradillo vines growing in light sandy soil at Wedderburn (S.C.).

MAGNESIUM DEFICIENCY. Symptoms of this disorder were noted in vines growing in light sandy soil at Corowa (R.).

MULBERRY

LEAF SPOT (Septogloeum mori). Heavy infection was reported throughout the State.

BACTERIAL BLIGHT (Pseudomonas mori). Infection was severe and widespread.

OLIVE

DIE-BACK (Verticillium dahliae). This disease was reported for the first time in N.S.W. on this host from Griffith (M.I.A.), where trees 4-5 years old in several orchards were affected. In all cases tomatoes had previously been grown in the land.

STRAWBERRY

VIRUS DISEASES. Prevalent as usual.

LEAF SPOT (Mycosphaerella fragariae), SCORCH (Diplocarpon carliana) and BLIGHT (Dendrophoma obscurans) were prevalent in coastal districts following spring rains.

LEAF BLOTCH (Gnomonia fragariae) caused substantial fruit losses and damage to foliage following rain in September and October in a Wetherill Park (M.A.) planting of Birkwood's Choice. It was at first thought that this was the first record of Gnomonia fragariae in N.S.W. but subsequently a herbarium specimen, wrongly labelled, dating back to 1914 was found. This indicates that the disease has been here for many years, but probably requires rather wetter spring conditions than are normally experienced in the spring in N.S.W. to cause much loss.

WALNUT

BACTERIAL BLIGHT (Xanthomonas juglandis) was of widespread occurrence and caused some heavy losses in tableland districts.

ORNAMENTALS

AZALEA (Rhododendron hybrids)

FLOWER BLIGHT (Ovulinia azaleae) was recorded for the first time in N.S.W. from Wahroonga (M.A.) in November, 1959, and was later seen at Pennant Hills (M.A.) and Mount Wilson (C.T.). Complete spoilage of flowers occurred on bushes at Wahroonga and a prominent feature of the disease was the way in which the browned flowers adhered to the bush for several weeks. The flat black sclerotia of the fungus were found at the bases of the petals.

It is quite possible that this disease has been present for some years in N.S.W. Conditions during the spring were especially favourable for its

development.

LEAF GALL (Exobasidium vaccinii) was very common in Metropolitan gardens during spring and summer and was also recorded at Cessnock (C.C.) and Newcastle (C.C.). Both the indica and kurume types were affected but the pink and red flowered varieties appeared to be much more susceptible than the white flowered ones.

LEAF SPOT (Cercospora sp., probably C. handelii) was recorded from Beecroft (M.A.) causing premature leaf fall in susceptible varieties.

OTHER DISEASES recorded were POWDERY MILDEW (Oidium sp.) on shaded bushes at Beecroft (M.A.) and LEAF SPOT (Septoria azaleae) from Lane Cove (M.A.).

BEGONIA (Begonia sp.)

POWDERY MILDEW (Oidium sp.) was seen on rex begonias at Curl Curl (M.A.).

LEAF NEMATODE (Aphelencoides olesistus) was reported on rex begonias at Mascot (M.A.).

BLECHNUM CARTILAGINEUM

LEAF NEMATODE (Aphelencoides olesistus) was seen on plants growing in a shaded position at Beecroft (M.A.).

BOOBIALLA (Myoporum montanum)

ROOT KNOT (Meloidogyne sp.) was found on trees growing at Griffith (M.I.A.).

CAMELLIA (Camellia japonica)

CAMELLIA YELLOW MOTTLE (virus) was seen on plants growing at Cowra (C.T.) and Batlow (S.T.).

COLLAR ROT (Phytophthora cinnamomi) killed two young container grown specimens at Bexley (M.A.).

CRABAPPLE (Malus spp.)

BLACK SPOT (Venturia inaequalis) was recorded on a crabapple from Oberon (C.T.), together with POWDERY MILDEW (Oidium sp.).

LINE PATTERN MOSAIC (suspected virus) was recorded on one tree of Malus ioensis at North Parramatta (M.A.).

CREPE MYRTLE (Lagerstroemia indica)

POWDERY MILDEW (Uncinula australiana) was common during the spring and summer in the Metropolitan Area and was also recorded from Taree (C.C.).

DAFFODIL (Narcissus pseudo-narcissus)

STEM AND BULB NEMATODE (Ditylenchus dipsaci) caused severe damage to daffodils at Camden (S.C.) and Orange (C.T.).

BASAL ROT (Fusarium oxysporum f. narcissi) caused heavy losses in a planting at Camden (S.C.) and was also reported from Cowra (C.T.) and

Orange (C.T.).

MOSAIC (virus) was seen in daffodil plantings at Cowra (C.T.), Orange (C.T.) and Liverpool (M.A.).

DAHLIA (Dahlia garden varieties)

ROOT KNOT (Meloidogyne sp.) was seen on dahlias at Cessnock (C.C.) causing severe damage to the stem tissue above the tubers. There was very little damage to the tubers themselves.

DAISY (Bellis perennis)

RUST (Puccinia distincta) was present on many plants in the Metropolitan Area.

DAPHNE (Daphne sp.)

VIRESCENCE (undetermined) was seen on bushes growing at Taree (C.C.).

DELPHINIUM (Delphinium sp.)

BACTERIAL BLIGHT (Pseudomonas delphinii) was recorded from Wyong (C.C.) causing severe leaf and stem damage.

EUCALYPT (Eucalyptus sp.)

LEAF SPOT (Mycosphaerella sp.) was recorded on gums at Strathfield (M.A.).

GERALDTON WAX PLANT (Chamaelaucium uncinatum)

BUD BLIGHT (Botrytis cinerea) was recorded for the first time in N.S.W. on this host from Kyogle (N.C.).

GERANIUM (Pelargonium hortorum)

RUST (Puccinia pelargonii-zonalis) was very common on the leaves of zonal varieties in the Metropolitan Area and was also recorded from Gunnedah (N.W.S.) and Mungindi (N.W.P.).

GERBERA (Gerbera sp.)

WHITE RUST (Albugo tragopogonis) was widespread in the Metropolitan Area and was also recorded from Taree (C.C.) and Murwillumbah (N.C.). This disease was recorded for the first time in N.S.W. only last season.

LEAF SPOT (Cercospora sp). was again very common in coastal districts.

POWDERY MILDEW (Oidium sp.) was recorded from Port Kembla (S.C.).

GLADIOLUS (Gladiolus hortulanus)

NECK ROT AND LEAF SPOT (Botrytis gladioli) were very prevalent during the spring and early summer months, being favoured by the damp weather conditions. Severe damage was caused to many plantings in the Metropolitan Area and the disease was also recorded from Wyong (C.C.) and Lismore (N.C.).

YELLOWS AND BASAL BROWN ROT (Fusarium oxysporum f. gladioli) caused 100% infection in several lines in a commercial plantation at Bilpin (C.T.).

CORM ROT (Sclerotinia gladioli) was responsible for heavy losses in a crop grown in new ground at Wyong (C.C.). This land was subject to wash from old gladiolus ground. Moderate losses were also experienced in a crop at Orange (C.T.) which was not dug at the correct time.

LEAF BLOTCH (Curvularia trifolii f. sp. gladioli) was recorded for the first time in this State causing severe leaf damage at Wyong (C.C.). The variety Picardy was particularly susceptible. The grower reported that the same disease had also been severe last year.

HYACINTH

BULB ROT (Ditylenchus dipsaci) was recorded at digging time on the bulbs of several varieties grown at Bowral (S.T.). The bulb scales had rotted down from the top and the nematodes were rapidly followed by a secondary yellow soft rot.

INDOOR PLANTS

HORMONE WEEDKILLER INJURY. The use of 2.4.5.T for control of blackberries in an adjoining property resulted in severe damage to many indoor plants in a nursery at Ermington (M.A.). Those chiefly affected were caladiums, aphelandras and philodendrons. Considerable leaf distortion was caused and the grower was advised to prune heavily in order to try to stimulate new undamaged growth.

IRIS (Iris spp.)

LEAF SPOT (Heterosporium iridis) caused severe damage to irises in a home garden at Mona Vale (M.A.) and was also seen in many other Metropolitan Area gardens.

MOSAIC (virus) was seen on rhizomatous irises at Tamworth (N.T.).

KURRAJONG (Brachychiton acerifolium)

LEAF SPOT (Cylindrosporium sp.) caused severe damage to three-year old trees at Brewarrina (W.D.) and was also reported from Gulgong (C.T.).

OLEANDER (Nerium oleander)

BACTERIAL GALL (Pseudomonas ~~tonelliana~~ savastanoi) was recorded on many bushes in the Metropolitan Area, causing damage to buds, twigs and leaves.

WOODY GALL (cause undetermined) was seen on bushes at Bonny Doon Golf Club (M.A.).

PALM (Phoenix sp.)

LEAF SPOT (Graphiola phoenicis) was seen on several palm trees in the Metropolitan Area.

PEACH, FLOWERING (Prunus sp.)

VIRESCENCE (cause undetermined) was seen on flowering peaches at Pymble (M.A.) and Quirindi (N.W.S.).

PETUNIA (Petunia hybrida)

WATERY STEM ROT (Sclerotinia sclerotiorum) caused patchy infection in seedbeds at a Wyong (C.C.) nursery.

PRIMULA (Primula malacoides)

CROWN ROT (Phytophthora parasitica) affected more than twenty-five per cent. of plants grown in the Sydney Botanic Gardens (M.A.) during the summer months.

ROSE (Rosa spp. and hybrids)

ROSE WILT (virus) did not cause as much damage this season as last year, symptoms being masked by the high summer temperatures. By careful selection of disease-free stock and bud material, some nurserymen have been able almost to eliminate wilt.

BLACK SPOT (Actinonema rosae) was again responsible for severe leaf spotting and defoliation of bushes during the late summer and autumn.

POWDERY MILDEW (Oidium sp.) was very severe throughout the year in the Metropolitan Area and was also reported causing damage at Wyong (C.C.), Quirindi (N.W.S.) and Curlewis (N.W.S.).

STEM CANKER (Coniothyrium fuckelii) was seen on many bushes, in some cases associated with SUN SCALD which occurred during the summer. Severe damage was caused at a nursery at Carlingford (M.A.) and in a garden at Mittagong (S.T.). The disease was also recorded from Moss Vale (S.T.) and Wellington (C.W.S.).

CROWN GALL (Agrobacterium tumefasciens) caused heavy losses in recently budded plants under wet conditions in a nursery at West Pennant Hills (M.A.).

SAINTPAULIA

FOLIAR NEMATODE (Aphelencoides olesistus) was observed in a Mascot (M.A.) nursery.

SNAPDRAGON (Antirrhinum majus)

RUST (Puccinia antirrhini) was common in gardens during the late spring and summer.

STOCK (Matthiola spp.)

MOSAIC (virus) was prevalent in a commercial planting of column stocks at Parramatta (M.A.).

STEM ROT AND FLOWER BLIGHT (Sclerotinia sclerotiorum) was seen in a home garden at Chatswood (M.A.).

SWEET PEA (Lathyrus odoratus)

SHOOT BLIGHT (Broad bean wilt virus) caused severe damage to many sweet peas in the Metropolitan Area during the late winter and early spring.

VEGETABLES

ARTICHOKE (JERUSALEM)

ROOT AND CROWN ROT (Sclerotium rolfsii) caused severe damage in a crop at Roseville (M.A.) in March.

ASPARAGUS

No records.

BEAN:

BEAN SEED CERTIFICATION SCHEME:

The Bean Seed Certification Scheme was continued for the seventeenth successive season. Again comparatively few crops were planted because of the large amount of bean seed available. Of 41 crops inspected, 28 were certified and 3 approved for growing for certification next season. Of the 10 crops rejected for certification, 2 were rejected because of the presence of halo blight, 1 because of anthracnose, 4 were picked for green beans, 1 was destroyed by rain and 2 had excessive weed growth.

RUST (Uromyces appendiculatus) was unusually severe in spring crops in coastal districts during the year. Spring 1959 was damp and humid, with warm days and cool nights, and very favourable for the rapid development and spread of rust. This early spring infection by rust also occurred in 1958 at Gosford (C.C.) and is unusual, the worst damage from bean rust usually being recorded in autumn.

ANTHRACNOSE (Colletotrichum lindemuthianum) caused severe damage in several Central and North Coast crops during summer and autumn and this severity in the field was reflected by the finding of the disease in several consignments arriving at the Sydney Municipal Markets.

Work on the production of a disease resistant dwarf bean continued this season. Ninety-six cross-bred lines were grown in the field at Hawkesbury Agricultural College, Richmond, and many selections were made. Several of the introduced commercial varieties and wild Phaseolus vulgaris found to be resistant to anthracnose in glasshouse tests were also grown in the field. The wild Ph. vulgaris line No. 345 appears to be especially promising as a breeding parent as it is a very high yielding dwarf type. Its pods are purple in colour and of a navy-bean type. It is completely resistant to anthracnose and has not shown any sign of rust or common blight when grown in the field amongst varieties heavily infected with these diseases. Some crosses with Hawkesbury Wonder were made this season.

HALO BLIGHT (Pseudomonas phaseolicola) was not severe this season and only a few reports of slight damage were received.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) caused very severe damage to beans grown during the winter on the far North Coast. In several cases, over 50% losses were experienced. No control was achieved by spraying. Most of the attack on the plants was well above ground level and appeared to originate from air-borne ascospores. In some of the vegetable areas of the North Coast, quite intensive production is carried out and this, together with the failure to remove diseased trash, is probably one of the main contributing factors to the severity of the disease in this region.

BACTERIAL BROWN SPOT (Pseudomonas syringae) was present in many spring crops at Gosford (C.C.) and Maitland (C.C.) and also caused severe damage to irrigated crops at Dareton (W.D.). Spraying with Bordeaux mixture did not give control of this disease in the Dareton crops.

BACTERIAL POD TWIST (Pseudomonas flectens) was recorded for the first time in N.S.W. from a crop of Brown Beauty at Bega (S.C.). This disease has probably been present for many years in N.S.W. and has been confused with thrips injury, which it superficially resembles.

AMERICAN COMMON BLIGHT (Xanthomonas phaseoli) caused severe damage to navy bean crops at Guyra (N.T.) and Inverell (N.W.S.). It is the most serious disease of navy beans in this State and has caused heavy losses over the past few years. An attempt was made this year to produce a small quantity of disease-free seeds for use as mother seed but all the lines under test became infected with either common blight or anthracnose. This work is to be continued next season, using only small quantities of seed.

OTHER DISEASES recorded this year were MOLYBDENUM DEFICIENCY which was very severe in a crop at Goonellabah (N.C.) and POD INTUMESCENCE which was present in many crops in the Murwillumbah (N.C.) district, It is suspected that this disorder is caused by the bean rust fungus, as it is often found in heavily rusted crops. STEM ROT (Rhizoctonia sp.) caused severe damage to crops at Murwillumbah (N.C.) and Windsor (M.A.).

BEAN, BROAD

VASCULAR WILT (Broad bean wilt virus) was present in several crops causing almost complete loss in one crop at St. John's Park (M.A.) and RUST (Uromyces fabae)was recorded from one crop at West Hoxton (M.A.). This disease has been present in N.S.W. for many years but rarely causes severe damage.

BEETROOT AND SILVER BEET

BEET NEMATODE (Heterodera schachtii). Further surveys were carried out during the year to determine the extent of infestation of market gardens in the Sydney Metropolitan Area. Viable cysts of the nematode were found in three market gardens at Matraville, and non-viable cysts on two properties at Caringbah, one property at Lansdale and one at Epping. No cysts were found in market gardens at Eastwood, St, Ives, Carss Park or Lugarno.

These findings, combined with those of previous surveys, indicate that viable nematodes are present in the old established market gardening areas of Botany, Brighton, Mascot, Matraville and Milperra. The rezoning of these areas for industrial or domestic purposes has terminated or will terminate their use for market gardening, Where growers have moved from these areas and commenced market gardening on the heavy soils of the outer Sydney Metropolitan Area, no evidence was obtained to indicate that a beet nematode problem would be expected.

LEAF SPOT (Cercospora beticola). Slight infection by this fungus was present in commercial plantings of beetroot and silver beet but in most cases did not cause a significant economic loss with the exception of an outbreak in a commercial crop at Tweed Heads (N.C.) where infection was very severe.

CARROT

LEAF BLIGHT (Alternaria porri f. sp. dauci) caused damage to a small crop at St. Ives (M.A.).

CROWN ROT (Rhizoctonia sp.) was recorded from a crop at Dunedoo (C.W.S.). Many roots were destroyed by secondary bacterial soft rot entering through the lesions caused by the fungus.

SALT TOXICITY. Severe leaf scorching, associated with a chloride content of 3.36% was recorded from Griffith (M.I.A.).

CELERY

No records.

CRUCIFERS

BLACK ROT (Xanthomonas campestris) caused yield reductions of up to 50% in cauliflower crops in the Rockley and Georges Plains areas (C.T.). Infections in crops in these areas commonly occur each season and it would appear that lack of adequate crop rotation is a very significant contributing factor. The disease was also present on cauliflower crops at Inverell (N.W.S.) and cabbage at Tweed Heads and Mullumbimby (N.C.).

CAULIFLOWER MOSAIC (Cauliflower Mosaic Virus). This disease was recorded for the first time in this State in August, 1959, on cauliflowers at Fairfield West and St. John's Park (M.A.). Infection was detected in 10 crops of the varieties Deepheart and Metropole. The level of infection in individual crops varied from 1-2% to 60-70% with an average of some 25%. In crops which were nearing maturity at the time infection had taken place little depressing effect on yield occurred but heavy loss was sustained in crops where infection had taken place when the plants were only 6-9 inches high.

The aphid Myzus persicae, a vector of the virus, was found in all affected crops and had doubtless introduced the virus, which is not seed-borne. Under the system of cropping practised in the area a source of inoculum in cruciferous vegetables would be present throughout the year. An examination of a number of cruciferous weeds in the locality showed that, at the time, these weeds were not infected with the virus which is confined in its host range to plants of the botanical family Cruciferae.

CABBAGE RING SPOT (Cabbage Black Ringspot Virus). A slight infection of this virus was observed in a cabbage crop at Fairfield West (M.A.) in August.

DOWNY MILDEW (Peronospora parasitica). A light infection was present in cauliflower crops at Fairfield West (M.A.) in August.

BLACKLEG (Phoma lingam) infected 60-70% of an experimental planting of a four months cauliflower, No. 192, in a seed merchant's trial at Carlingford (M.A.). A nearby row of the variety Deepheart showed 100% infection. No cruciferous vegetables had been grown in the plot for the previous 5 years.

The disease was also present in a planting of No. 192 from the same seed source at Maitland (C.C.). Infection was reported to be 100% while in a nearby crop of Deepheart there was no infection.

CLUB ROT (Plasmodiophora brassicae) caused an 80% loss in a commercial planting of cabbage and cauliflower at Liverpool (M.A.). as the result of planting in infested soil. It was also recorded on Brussels Sprouts in a home garden at Crookwell (S.T.).

SCLEROTINIA ROT (Sclerotinia sclerotiorum) caused a 10% loss in a Brussels Sprout crop at Mittagong (S.C.) in June.

LEAF SPOT (Alternaria brassicicola) caused severe leaf spotting and curd discoloration in a large commercial planting at Bathurst (C.T.). Infection was favoured by very wet conditions. The disease caused moderate damage to cauliflowers in the Windsor-Richmond area (M.A.) in late winter.

BLACK ROOT OF RADISH (Aphanomyces raphani) was troublesome in radish crops in the Matraville area (M.A.) in the warm months of the year, losses of up to 50% being recorded.

BORON DEFICIENCY (Non parasitic) caused some hollow stem and curd deformation in cauliflowers at Windsor and Richmond (M.A.) in crops where growers had not applied sufficient borax.

WHITE LEAF SPOT (Cercosporella brassicae). A moderate infection of this disease was recorded in a commercial cabbage crop at Moss Vale (S.C.).

WIRE STEM (Rhizoctonia solani) caused a complete loss of cauliflower seedlings in a home garden at Goulburn (S.T.) and was also recorded on cabbage at Tumut (S.T.).

CUCURBITS

POWDERY MILDEW (Oidium sp.). It was reported in the 1958-9 survey that the resistance of the variety P.M.R.45 to powdery mildew had broken down in the Murrumbidgee Irrigation Areas and the Lower Murray Area of New South Wales in the 1958-59 season. In the 1959-60 season the varieties P.M.R.5, P.M.R.6 and Edisto were moderately to heavily infected with powdery mildew in the Lower Murray Area. P.M.R.45 and Spartan Rock were also heavily infected in this area, as also were the crosses P.M.R.5 x Spartan Rock (F_2), P.M.R.6 x Spartan Rock (F_1), (P.M.R.5 x Rio Sweet (F_1)) x (P.M.R.5 x Spartan Rock (F_1)) F_1 and P.M.R.5 x Spartan Rock (F_1). The fact that P.M.R.5 and P.M.R.6 and seedlings derived from these varieties have proved susceptible to powdery mildew precludes their use in the rockmelon breeding programme because of the general agronomic superiority of P.M.R.45.

Although the perfect stage of the powdery mildew attacking P.M.R45, and P.M.R.5 and P.M.R.6 has not been found to date the oidial stage corresponds in many features (notably the presence of well developed fibrosin bodies) to that of Sphaerotheca fuliginea. If, as claimed by workers in the United States, P.M.R.45 and P.M.R. 5 & 6 had been bred for resistance to races 1 and 2 respectively of Erysiphe cichoracearum, then resistance to S. fuliginea would not be expected in these varieties. The fact that P.M.R.45 has been resistant to powdery mildew for more than 20 years could possibly indicate a recent invasion by S. fuliginea.

Powdery mildew is rarely found on watermelon in New South Wales but a moderate infection of this crop was detected at Maraylya (M.A.) in February.

FUSARIUM WILT OF ROCKMELON (F. oxysporum f. melonis). This disease continues to be destructive in early rockmelon crops in the Murrumbidgee Irrigation Areas and, during the year, was recorded in the Lower Murray Area (W.D.) where it caused moderate to heavy losses in experimental plantings of the varieties P.M.R.5, P.M.R.6, hybrids from these varieties and Edisto. The variety Spartan Rock was resistant but the small fruit produced by this variety precludes its use other than as a source of resistance to Fusarium Wilt in the rockmelon breeding programme.

On the Murrumbidgee Irrigation Area Fusarium Wilt caused a 100% loss in a planting of the variety Edisto, 10% loss in P.M.R.45, 35% loss in P.M.R.5, and 15% loss in P.M.R.6.

DOWNY MILDEW (Pseudoperonospora cubensis). This disease caused moderate to heavy losses in cucumbers and rockmelons in late summer in the Metropolitan Area and on the Central and North Coast. At Lower Portland (M.A.) the cucumber varieties Crystal Apple and Supermarket (Palomar) were heavily infected but the disease caused only slight damage on the variety Palmetto.

ANTHRACNOSE (Colletotrichum orbiculare). A moderate infection was noted in a cucumber crop at Dural (M.A.) in mid February. Four varieties were grown, viz. Stono, Ashley, Supermarket and Palmetto. There was no discernible difference in the reaction of these varieties to the disease.

A heavy infection of anthracnose occurred on commercial crops of the watermelon varieties Candy Red (Charleston Grey) and Sugarstick at Maraylya (M.A.) in February, although only slight infection was present on crops of Candy Red at Lower Portland (M.A.) at the same time.

BLACK ROT OR GUMMY STEM BLIGHT (Mycosphaerella melonis). This disease was recorded for the first time in New South Wales in two crops of the watermelon variety Candy Red, one at Castlereagh (M.A.) and the other at Lower Portland (M.A.). In both crops infection was of the order of 50% although a relatively greater economic loss occurred in the crop at Castlereagh than in that at Lower Portland. In both instances growers stated that they had not previously observed the disease and one grower had saved his own seed for five years.

Good proof of the seed-borne nature of the black rot fungus is lacking and it is generally considered that infection arises from the infected debris of a previous crop.

FUSARIUM FOOT ROT (Fusarium solani f. cucurbitae) was responsible for a 50% loss in a commercial crop of bush marrow at Tabulam (N.C.) in March and a 2% loss in bush marrows at Lansvale (M.A.) in January. A foot rot of cucumber occurred to a small extent in a crop at Lower Portland (M.A.) in March. The disease bore marked resemblance to Fusarium foot rot and is being further investigated.

MOSAIC (? Melon mosaic virus) caused 100% infection of bush marrows at Lansvale (M.A.) in January. 1-2% infection was also present in Crown Prince pumpkins on the same property.

YELLOWS (Molybdenum deficiency) was recorded in watermelons at Grafton (N.C.) and in cucumbers at Terranora (N.C.) in October. A number of rockmelon crops on the Murrumbidgee Irrigation Areas were also affected during the spring and summer.

EGG PLANT

VERTICILLIUM WILT (Verticillium sp.) caused a 70% loss in a commercial crop at Pendle Hill (MA.) and a 100% infection was recorded in a commercial crop at Cowra (C.T.).

LETTUCE:

BIG VEIN (undetermined) was again seen in many spring lettuce crops in market gardens in the Metropolitan Area and also in crops at Murrumburrah (S.W.S.) and Lismore (N.C.). Roots of many big vein plants were examined and in all cases resting sporangia and sometimes zoosporangia of Olpidium brassicae were found to be present. The same fungus was also found on several occasions in the roots of plants not showing big vein symptoms but in these cases root infection appeared to be much lighter than with big vein infected plants.

An attempt to control big vein by using soil treatments to control Olpidium was made in a commercial crop at Murrumburrah (S.W.S.). Very

little big vein showed up in this trial and none of the treatments differed from the untreated control.

MOSAIC (Lettuce mosaic virus) was very severe in most Metropolitan Area lettuce crops during the spring. In many cases, well over 50% loss occurred. Damage appeared to be associated with early infestation of crops with the aphid Macrosiphum euphorbiae, the most important vector of mosaic in this State.

LEAF SPOT (Septoria lactucae) caused severe damage under the moist conditions of spring 1959. Usually only a minor disease, leaf spot this season was so severe on outer leaves that it made drastic trimming of heads necessary and severelyreduced their market value. One grower at Pennant Hills (M.A.) claimed good control by spraying with a mixture of zineb and copper oxychloride (both at 1lb. to 50 gallons water).

The disease was also seen in seed crops grown in a Lower Murray R. locality (R.) and caused severe damage in some cases.

MUSHROOM

MAT DISEASE (Myceliophthora lutea) caused a 20-30% loss in a commercial crop at Narrabeen (M.A.) and an outbreak in a 6000 ft. crop at Windsor reduced the yield to $\frac{1}{4}$ lb. per square foot.

NEMATODES (Ditylenchus myceliophagus and Rhabditis spp.) caused some reduction in the yield of a commercial crop at Dural (M.A.).

ONION

DOWNY MILDEW (Peronospora destructor) was recorded from Cowra (C.T.) and Kyogle (N.C.).

LEAF BLIGHT (Heterosporium allii) was recorded for the first time in this State on onion seedlings growing at Orange (C.T.). The leaves of affected plants were shrivelling and dying back from the tip and fructifications of the causal fungus were found on the dying leaves.

OTHER DISEASES recorded were WHITE ROT (Sclerotium cepivorum) which caused 10% loss in a home garden at Burwood (M.A.) and NECK ROT (Botrytis allii) which caused severe damage in stored onions at Murwillumbah (N.C.).

PARSLEY

ROOT ROT (Meloidogyne sp.) was responsible for severe stunting of parsley plants at Cessnock (C.C.).

LEAF SPOT (Septoria petroselini) was widespread.

PARSNIP

No records.

PEA

MYCOSPHAERELLA BLIGHT (Mycosphaerella pinodes) was present in most coastal pea crops during the winter and spring of 1959 and in many cases caused severe damage. The damp spring weather conditions were very favourable for its development and spread. In the autumn of 1960,

however, dry conditions prevailed and compared to the preceding year, only a small amount of disease was present and very little damage was caused. Detailed examination of many crops showed that the disease was present in trace amounts in most of them, causing spotting and shrivelling of the lowest pair of leaves and perithecia were formed on these. Under damp conditions, a very rapid development of this disease would have been possible.

The importance of pea trash in the carry-over of Mycosphaerella blight was seen in a trial plot at Camden. (S.C.). Self-sown plants coming up in the autumn amongst the residue of a diseased crop which was chopped up (but not ploughed under) the preceding spring were heavily infected by ascospores arising from perithecia on the diseased trash. The removal of all diseased trash as soon as possible after the crop is harvested is fundamental in any attempt to control this disease.

DOWNY MILDEW (Peronospora pisi) caused serious damage to many pea crops in coastal districts during the winter. In many cases, a creamy discoloration of the pod occurred and seriously reduced their market value. Abundant oospores of the fungus were present in this pod tissue.

MOSAIC (Pea mosaic virus) was present to a small extent in many coastal crops but did not cause any damage.

POTASSIUM DEFICIENCY caused severe damage to three acres of peas at Mullumbimby (N.C.). Stunting and leaf scorching occurred and a very good response was obtained by applying ½ cwt. potassium chloride per acre.

PEPPER (Capsicum)

BACTERIAL WILT (Pseudomonas solanacearum) was recorded from Asquith (M.A.). This is the first record of this disease on pepper in New South Wales.

POTATO

LATE BLIGHT (Phytophthora infestans). In early spring late blight was responsible for moderate to severe defoliation of crops on the North Coast. The disease continued to be of importance in later crops in the Taree and Maitland areas (C.C.) where weather conditions in spring were very favourable for its attack. In the Sydney Metropolitan Area there was a greater than usual incidence of the disease in the late winter and spring crop. Late Blight reduced the yield of the Windsor-Richmond crop by 25%. Dry weather prevented disease development in the autumn crop. The tableland maincrop was not affected apart from a slight outbreak at Glen Innes (N.T.) in March.

During the year race 4 of P. infestans was detected for the first time in New South Wales, at Warriewood (M.A.). The natural occurrence of race 4 could not be explained on the basis of the field culture of R_4 genotypes in the locality and it would appear that mutation of race 0 to acquire the race 4 character had taken place. The natural occurrence of race 4 on potato varieties lacking the genes for immunity derived from Solanum demissum has been noted in a number of countries in the last few years and published work by overseas authorities strongly indicates that mutation from race 0 to race 4 takes place much more frequently than does mutation from race 0 to race 1, 2 or 3.

In co-operation with the Division of Plant Industry, the project for development of potato varieties immune to race 0 of P. infestans was continued. The results of this year's work showed that 33 agronomically promising seedlings were resistant. Of these seedlings, 15 were derived from the U.S. variety Cherokee, 7 from the U.S. variety Saco, 2 from the U.S. seedling B595-76, 7 from the Scottish seedling 1928(e)2, 1 from the Scottish seedling 885(4) and 1 from the Scottish seedling 1521c(3).

VIRUS DISEASES. Records of the Division of Plant Industry show that for the fifth successive season no potato crop submitted for certification in the Tableland areas of New South Wales was rejected because of excess leaf roll content, indicating an extremely satisfactory position of certified seed in regard to freedom from leaf roll infection. Also, no crop submitted for certification in the 1959/60 season was rejected on the basis of any other virus disease infection.

In 1958 the variety Walanga was no longer accepted for certification in New South Wales because of its high susceptibility to and tolerance of potato virus Y. Steps are now taken to ensure that a similar situation does not arise in regard to varieties released by this Department in the future. Field inoculation tests were carried out during the year on the seedling S2680 (since released as the variety Murru) to determine its reaction to current season infection by potato virus Y. These tests showed that the new variety reacted by the production of the typical "leaf drop streak" symptom. This is most satisfactory as current season infection would be easily detected during certification inspections and affected plants could be rogued.

POWDERY DRY ROT (Fusarium trichothecioides). The incidence of this disease in consignments of both certified and uncertified seed grown at Crookwell (C.T.) in the 1959/60 season was low. Some powdery dry rot occurred in a few consignments and it was stated that the crops concerned had all been dug with one particular brand of potato digger.

EARLY BLIGHT (Alternaria solani) was present in many crops at Guyra, Ebor and Black Mountain (N.T.) in late summer and early autumn causing moderate defoliation and some yield loss. Growers who applied copper oxychloride sprays to the crops satisfactorily controlled the disease. Generally, in crops in other areas, early blight was of minor importance.

SLCEROTINIA ROT (Sclerotinia sclerotiorum). An unusual outbreak of this disease occurred at Crookwell (C.T.). Four crops comprising 80 acres were affected. Stem infection was stated to be 50% in one crop and light in the other three. The crops were of certification standard in other respects and were passed as it was extremely unlikely that there would be any direct detrimental effect on the tubers.

BLACK DOT STEM ROT (Colletotrichum coccodes). An outbreak of this disease occurred in a commercial crop at Robertson (S.C.) in February. Affected plants occurred in patches through the crop and in all about 5% of the plants were severely affected by the disease.

COMMON SCAB (Streptomyces scabies) was recorded a number of times during the year in coastal and tableland crops but there were no reports of economic losses as a result of downgrading of affected tubers.

BROWN FLECK (Non parasitic)was severe in a commercial crop at Niangala (N.T.) and caused moderate damage in a 4 acre crop of Sebago at Red Range (N.T.).

Other diseases recorded during the year were RHIZOCTONIA DISEASE (R. solani) which caused a 2% loss of plants in a commercial crop at Spring Hill (C.T.), SILVER SCURF (Helminthosporium atrovirens) on tubers from Rydal (C.T.), two slight outbreaks of BLACKLEG (Erwinia atroseptica) in crops at Glen Innes (N.T.) and Eungalla (N.C.) and a number of records of tuber infestation by ROOT KNOT NEMATODES (Meloidogyne spp.), including a record of M. incognita var. acrita from Meadowbank (M.A.), this being a first record of this species on potato in New South Wales.

RHUBARB

DOWNY MILDEW (Peronospora jaapiana). A number of outbreaks of this disease were recorded in commercial crops and home garden plantings during the year but the only record of substantial damage was in a commercial crop at Maitland (C.C.) in July.

ANTHRACNOSE (Colletotrichum dematium) was recorded, for the first time in this State, at Caringbah (M.A.). The disease did not cause significant damage.

LEAF SPOT (Phyllosticta straminella) was present in most crops inspected during the year but was not of economic importance.

SWEET POTATO

SCURF (Monilochaetes infuscans) affected 50% of the tubers in a two acre planting at Wollongbar (N.C.).

TOMATO

YELLOW TOP (Tomato Yellow Top Virus). This was the predominant disease in tomato crops on the North Coast in late winter and spring, infections of 10-20% being common and some infections of 80-100% being recorded. The epiphytotic increased to such an extent that, over the summer months, it was largely responsible for the small supply of tomatoes available in that area. Crops from Coff's Harbour northwards were all similarly affected and even small isolated home garden crops showed a high level of infection. The disease continue to be active in the small acreage of autumn sown crops on the North Coast, overall infection being generally in the order of 5-10%, with 2 records of 40% and one of 90% infection being made.

In the Central Coast and Metropolitan Area crops, yellow top incidenc was generally low during the summer and autumn. In the Gosford and Mangrove Mountain Areas (C.C.) incidence of yellow top was less than 10%. In the Metropol itan Area there were some infections of 20% at Glenorie and Dural but infection in the Fairfield West-Liverpool-Leppington area was generally less than 5% with many crops showing less than 1% infection.

EARLY BLIGHT (Alternaria porri f. solani) occurred at epiphytotic level in crops in the Tweed R. district (N.C.) in September following prolonged wet weather early in the month. Considerable quantities of fruit, up to 50% in one crop, were infected and the productive life of the plants was reduced to about 4 weeks. Crops which commenced to yield later escaped much of the severity of the disease. Infection was milder in this area in late spring and summer and build up again to a high level in autumn causing significant fruit losses.

In the Central Coast and Metropolitan Area crops there were many instances of heavy infections in late summer and early autumn, resulting in much defoliation. Drier weather in late autumn considerably depressed the spread of the disease.

LEAF MOULD (Cladosporium fulvum) appeared in crops in the Tweed District (N.C.) in August and caused significant leaf defoliation where control measures were not taken. An unusual, moderately severe outbreak also occurred at Nambucca (N.C.) in August.

Glasshouse crops in the Sydney Metropolitan Area were heavily infected in early spring.

The incidence of the disease in summer and autumn crops was much greater than usual in outdoor crops in the Metropolitan Area and Central Coast, frequent applications of salicylanilide being necessary to hold the disease in check.

LEAF SHRIVEL (Potato Virus Y - leaf shrivelling strain) was recorded for the first time in this State causing heavy damage to some crops in the Tweed River area (N.C.) in late winter and spring. Infections of 50% were common and there were two records of 80% infections and one of 100%. The disease was also recorded at Duranbah (N.C.) in autumn and was severe in two crops in this locality in June.

YELLOW LEAF SHRIVEL (Potato Virus Y - leaf shrivelling strain + Tobacco Mosaic Virus - aucuba strain) was recorded for the first time in this State in a crop at Duranbah (N.C.) in September.

TOBACCO MOSAIC (Tobacco mosaic virus). The incidence of this disease in outdoor crops in the Sydney Metropolitan Area was much greater than usual during summer and autumn. At Lower Portland 100% infection was observed and instances of 50-100% infections were noted in a number of crops in the Liverpool-Leppington area with lesser infections in other crops in that locality. A heavy infection was also noted in a crop at Pennant Hills (M.A.).

FUSARIUM WILT (Fusarium oxysporum f. lycopersici) was present in a number of North Coast crops in summer but seldom caused economic damage. The disease was generally moderate in crops in the Liverpool-Leppington area (M.A.), infections of up to 30% being recorded. Fusarium wilt was also recorded from Gosford (C.C.), Glenorie (M.A.) and Finley (R.) (a 25% loss).

SPOTTED WILT (Tomato Spotted Wilt Virus) was present in trace amounts in three crops in the Tweed River area (N.C.) in September and a 1% infection was recorded at Tumbulgum (N.C.) in autumn. Incidence of spotted wilt in crops on the Central Coast and in the Sydney Metropolitan Area was also negligible. However, an epiphytotic of the disease occurred in canning crops on the Murrumbidgee Irrigation Area in December and January, up to 100% infection being recorded in some crops. The most severely affected crops were those which had received the least protective spraying with D.D.T. The disease was also recorded from Hay (R.) in May, Orange (C.T.) in January and Dungay (N.C.) in June.

GHOST SPOT AND FRUIT ROT (Botrytis cinerea). Severe infections of Ghost Spot were recorded from Nambucca (N.C.) and Macksville (N.C.) in September. Botrytis fruit rot was also recorded from Macksville and this disease caused significant losses in the glass housecrops at Warriewood and Mona Vale (M.A.) in early spring.

BACTERIAL SPOT (Xanthomonas vesicatoria) developed rapidly in crops on the North Coast in July, 1959, favoured by a period of prolonged wet weather. The disease was also recorded at Cudgen (N.C.) in June, 1960. Bordeaux spray programmes generally maintained good control of the disease in contrast with zineb and copper oxychloride schedules. The disease was of very minor importance in crops on the Central Coast this year.

SCLEROTINIA ROT (Sclerotinia sclerotiorum). This disease caused devastating losses in some crops in the Tweed district (N.C.) in July, in one instance the potential yield being cut by 60%. The disease was also present in a late crop at Wedderburn (M.A.) in July. A severe infection was recorded at Cudgen (N.C.) in June.

VERTICILLIUM WILT (Verticillium dahliae) caused some loss in crops in the Tweed district (N.C.) in plantings on old tomato land, some infections being in the order of 10%. A 30% loss was recorded at Leppington (M.A.) in April. The disease was also recorded from Hay and Deniliquin (R.). A very severe infection was recorded in June at Cudgen (N.C.) on land which had grown tomatoes in 1958.

BACTERIAL CANKER (Corynebacterium michiganense). Outbreaks of this disease occurred at Lismore (N.C.), Nambucca Heads (N.C.) (a 10% loss),

Macksville (N.C.), Castle Hill (M.A.) (a 20-30% loss), Leppington (M.A.) and Hanwood (M.I.A.) (a 40% loss).

BACTERIAL WILT (Pseudomonas solanacearum) was present in a number of crops on the North Coast in summer and early autumn, some crops showing 25-40% infection, but generally, the level of infection was 2-5%.

SEPTORIA SPOT (Septoria lycopersici). In the Tweed District (N.C.) this disease appeared in August and became widespread resulting in much defoliation of plants in September. The disease was otherwise of little economic importance in commercial crops in the State this year.

DROP HEAD WILT (Tobacco Mosaic Virus) was of little economic importance in glasshouse crops at Warriewood and Mona Vale (M.A.) last spring. The disease was recorded in glass-house crops at Dareton (W.D.) in September.

SCLEROTIUM STEM ROT (Sclerotium rolfsii) was present in many tomato crops on the North Coast in late summer, infections however being in the order of only 2-3%. The disease was also recorded at Richmond (M.A.) in January.

BLACK DOT STEM ROT (Colletotrichum coccodes) was recorded for the first time in this State at Darlington Point (M.I.A.) where it caused a 90% loss in one crop.

LATE BLIGHT (Phytophthora infestans) was of negligible importance this year. Only two instances of late blight fruit rot were recorded, from Mittagong (S.C.) and Robertson (C.C.).

SOFT ROT (Erwinia carotovora). Following rain in spring, some crops in badly drained soils in the Sydney Metropolitan Area suffered up to 30% loss because of internal stem invasion by soft rot bacteria. A 10% loss of plants was recorded at Carlingford (M.A.) in autumn. Soft rot of fruit caused 5% loss in a crop at Duranbah (N.C.).

BACTERIAL SPECK (Pseudomonas tomato) was present in trace amount in seedlings at Leeton (M.I.A.) in October.

ROOT KNOT (Meloidogyne sp.) was prevalent as usual in crops in sandy soils in the Sydney Metropolitan Area, some infections of up to 20% being recorded. A 50% loss was recorded at Bethungra (S.W.S.).

ROOT AND COLLAR ROT (Rhizoctonia solani) was recorded from Cargo (C.T.), Breadalbane (S.T.) and Dural (M.A.) (a 12% loss).

SALT TOXICITY AND DAMPING OFF (Rhizoctonia solani and Pythium sp Salt toxicity resulting from the presence of excess chloride and sulphate ions in the seedbed soil, combined with the action of damping off fungi, was responsible for the death of 25% of seedlings of the variety KY1 and of 30-40% of the variety Tatint grown by a commercial nurseryman at Leeton (M.I.A.) for distribution to producers of canning tomatoes. These figures represent the actual loss which occurred as a result of death of the seedlings at or soon after planting out. Only those seedlings survived which were capable of extending new roots into the soil outside the layer of seed bed soil. In addition 20-30% of the remaining seedlings were not planted out because of their obviously debilitated condition. The soil which had been used in the seed boxes was taken from an old swamp area where the salts had doubtless accumulated, and no precautions had been taken to prevent the occurrence of damping off.

BLOSSOM END ROT (Non-parasitic) was responsible for considerable fruit loss in North Coast crops in February during hot dry weather and was present in crops in other areas to a small extent during summer and autumn.

HORMONE WEED KILLER INJURY (Non-parasitic) occurred at Cudgen (N.C.) in a crop adjacent to a sugar cane planting sprayed by helicopter with a 2-4,D formulation one month previously. Hormone injury was also reported from Duranbah (N.C.), again in an area where spraying of weeds by helicopter had been carried out. Severe hormone injury was also present in tomato specimens received from Urunga and Kempsey (N.C.) and Medowie (C.C.).

MISCELLANEOUS PLANTS

BATHURST BURR (Xanthium spinosum)

ANTHRACNOSE (Colletotrichum gloeosporioides) was recorded in the north-west and also in a pot experiment in the Metropolitan Area.

ST. JOHN'S WORT (Hypericum perforatum)

ROOT ROT (undetermined) was severe at Mudgee (C.T.) where a dense stand died out almost completely.

NEW PLANT DISEASES

During the year ended 30th June, 1960, sixty-one new records of plant diseases were made in N.S.W. These are listed below, with comments on the more important or interesting records.

Allium cepa L. (Onion). - Leaf blight (Heterosporium allii Ell. & Mart.); Orange (C.T.)

Angophora lanceolata Cav. (Smooth-barked apple). - Trunk rot (Fomes setulosus Lloyd); Wollstonecraft (M.A.).

Berberis thunbergii DC (Barberry).. - Wilt and die back (Verticillium dahliae Kleb.); Pennant Hills (M.A.).

Brassica campestris L. (Swede). - Mosaic (Cabbage black ringspot virus); Bilbul (M.I.A.).

Brassica oleracea botrytis L. (Cauliflower). - Mosaic (Cauliflower mosaic virus); Fairfield West and St. John's Park. (M.A.).

Callicoma serratifolia Andr. - Algal leaf spot (Cephaleuros virescens); Baulkham Hills (M.A.).

Capsicum annuum L. (Capsicum). - Wilt (Pseudomonas solanacearum E.F. Smith); Asquith (M.A.).

Chamaecyparis obtusa cripsii Sieb. & Zucc. (Golden Cypress). - Root Rot (Armillaria mellea (Vahl ex. Fr.) Quel); Medlow Bath (C.T.).

Chamaelaucium uncinatum Schau. (Geraldton Wax). - Bud blight (Botrytis cinerea Pers. ex Fr.); Kyogle (N.C.).

Chenopodium album L. (Fat Hen). - Mosaic (suspected virus); Richmon (M.A.).

Citrullus vulgaris Schrad. (Watermelon). - Black rot and gummy stem blight (Mycosphaerella melonis (Pass.) Chiu & J.C. Walker); Castlereagh, Lower Portland (M.A.).

Crotalaria spectabilis Roth. - Stem and pod blight (Botrytis cinerea Pers. ex Fr.); Narara (C.C.).

Cynodon dactylon (L). Pers. (Couch grass). - Leaf blight (Cylindrosporium sp.); Grafton (N.C.).

Dianthus hybrid (Pink). - Root knot (Meloidogyne sp.); Basin View, near Nowra (S.C.).

Elaeocarpus reticulatus Sm. (Blue-berry ash). - Leaf spot (cercospora sp.); Baulkham Hills (M.A.).

Erigeron sp. (a fleabane). - Leaf spot (Cercospora sp.); Werombi (S.C.).

Eucalyptus globulus Labill. (Tasmanian blue gum). - Leaf spot (Cercospora epicoccoides Cooke & Massee); Balgowlah (M.A.).

Ficus carica)L. (Fig.) - Leaf and shoot anthracnose (Colletotrichum gloeosporioides Penz.); Taree (C.C.).

Fragaria sp. (Strawberry). - Leaf blotch (Gnomonia fragariae Laibach); Wetherill Park (M.A.) Collected but not recorded in 1914.

Galinsoga parviflora Cav. (Potato weed). - Crown rot (Sclerotium rolfsii Sacc.); Caringbah (M.A.).

Gladiolus var. Picardy (Gladiolus). Brown leaf spot (Curvularia trifolii (Kauffm.) Boed. f. sp. gladioli Parmelee & Luttrell); Wyong (C.C.).

Glycine tabacina (Labill.) Benth. - Leaf, petiole and stem gall (Synchytrium sp.); Brown Mountain (S.C.).

Gossypium hirsutum L. (Cotton). - Damping-off (Rhizoctonia sp.); Curlwaa (W.D.).

Hardenbergia violacea (Schnew.) Stearn (False sarsaparilla). - Leaf and stem scab (Elsinoe sp.); Werombi (S.C.); rust (Uromyces hardenbergiae McAlp.); Werombi (heavily parasitised by Darluca filum Cast.) S.C.).

Hyparrhenia hirta (L.) Stapf. - Ergot (Claviceps sp., conidial stage only); Trangie (C.W.S.).

Lactuca sativa L. (Lettuce). - Mosaic (Lettuce mosaic virus): this disease has been present for many years and is widespread but has not previously been listed in N.S.W. plant disease lists.

Lotononis bainesii Baker. - Blight (Botrytis sp.); Grafton (N.C.).

Lupinus angustifolius L. (New Zealand blue lupin). - Stem rot (Sclerotinia sclerotiorum (Lib.) de Bary); Camden (S.C.).

Lycopersicon esculentum Mill. (Tomato). - Black dot root rot (Colletotrichum coccodes (Wallr) Hughes) Griffith (M.I.A.); Root knot (Meloidogyne incognita (Kofoid & White) Chitwood); Ettalong (C.C.). (M. incognita acrita Chitwood Griffith, (M. Javanica (Treub.) Chitwood) Maitland (C.C.). Root knot has been known on tomatoes in N.S.W. for many years but it is only recently that precise determinations of the species of Meloidogyne causing the disease have been made. This applies to many of the root knot records in this State.

Malus ioensis (Wood) Britt. (Crabapple). - Leaf spot (Phyllosticta sp. associated); line pattern mosaic (suspected virus); North Parramatta (M.A.).

Michelia figo (Lour.) Bloom (Port wine magnolia). - Die-back (Verticillium dahliae Kleb.); Pennant Hills (M.A.).

Moluccella laevis L. (Molucca balm). - Stem rot (Sclerotinia sclerotiorum (Lib.) de Bary); Hillview (C.C.).

Morus sp. (Mulberry). - Fruit rot (Botrytis cinerea Pers. ex Fr.); Moree (N.W.P.).

Musa sp. (Banana). - Stem end rot of fruit (Thielaviopsis paradoxa (de Seyn.) V. Hohn); Tweed Heads (N.C.).

Narcissus jonquilla L. (Double jonquil). - Virescence (cause undetermined; Narara (C.C.).

Olea europea L. (Olive). - Die-back (Verticillium dahliae Kleb.); Griffith (M.I.A.).

Pennisetum clandestinum Hochst. (Kikuyu). - Leaf striation (may be a cold effect); Lismore (N.C.); widespread for many years.

Phalaris coerulescens Defs. - Ergot (Claviceps purpurea (Fr.) Tul.); Glen Innes (N.T.).

Phaseolus vulgaris L. (French bean). - Pod twist (Pseudomonas flectens J.C. Johnson); Bega (S.C.): this disease has probably been present for many years and, until the recent work of Johnson in Queensland, has been identified as thrips injury, which it superficially resembles.

Physostegia virginiana (L.) Benth. (Mock erica). - Root and stem rot (Sclerotium rolfsii Sacc.); Woodburn (N.C.).

Platylobium formosum Sm. - Leaf spot (Cercospora sp.); Baulkham Hills (M.A.).

Poa annua L. (Winter grass). - In roots (Olpidium brassicae (Wor.) Dang.); Murrumburrah (S.W.S.).

Prunus cerasus L. (Cherry, St. Margaret). - Bacterial spot (Xanthomonas pruni (E.F. Smith) Dowson); Kingsvale (S.W.S.).

Prunus persica Stokes (Peach). - Associated with root destruction (Heliocotylenchus nannus Steiner); Glenorie;(M.A.); bacterial spot (Xanthomonas pruni (E.F. Smith)=Dowson); Bathurst (C.T.).

Rheum rhaponticum L. (Rhubarb). - Leaf spot (Colletotrichum dematium (Pers. ex Fr.) Grove); Caringbah (M.A.).

Rhododendron hybrid (Indica azalea). - Flower blight (Ovulinia azaleae Weiss); Wahroonga (M.A.).

Rubus sp. (Blackberry). - Scab (Sphaceloma sp.); Werombi (S.C.).

Sansevieria sp. (Bowstring hemp). - Leaf spot (Colletotrichum crassipes (Speg.) v. Arx); Enfield (M.A.).

Scabiosa columbaria L. (Dove scabiosa). - Crown rot (Sclerotium rolfsii Sacc.); virescence (suspected virus); Pennant Hills (M.A.).

Senecio petasites DC. - Root rot (Phytophthora sp.); Cheltenham (M.A.).

Solanum tuberosum L.(Potato). - Root knot (Meloidogyne incognita acrita Chitwood); Meadowbank (M.A.).

Themeda australis (R. Br.) Staff. (Kangaroo grass). - Ergot (Claviceps sp.); Werombi (S.C.): heavily parasitised by Epicoccum andropogonis (Ces.) Schol-Schwarz.

Trifolium incarnatum L. (Crimson clover). - Burn (Pseudoplea trifolii (Rostr.) Petri); Comboyne (C.C.).

Verbena bonariensis L. (Purple top). - Leaf spot (Cercospora sp.); Ashford (N.W.S.), Werombi (S.C.).